HiPath 3000 V5.0
HiPath 5000 V5.0

Service Manual

SIEMENS

Global network of innovation

ESHB.50.045.05.02.01 02/05

1P P31003-H3550-S403-4-7620

The information provided in this document contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. The trademarks used are owned by Siemens AG or their respective owners.

The device conforms to the EU directive 1999/5/EG, as attested by the CE mark.

This device has been manufactured in accordance with our certified environmental management system (ISO 14001). This process ensures that energy consumption and the use of primary raw materials are kept to a minimum, thus reducing waste production.

© Siemens AG 2005 •
Siemens Communications,
Hofmannstraße 51, D-81359 München, Germany
Reference No.: P31003-H3550-S403-4-7620
Subject to availability. Right of modification reserved.

Contents

1 Important Information . . . 1-1
1.1 Overview . . . 1-1
1.2 Structure of this Electronic Service Manual . . . 1-2
1.3 Electrical Environment . . . 1-4
1.4 Safety Information . . . 1-5
  1.4.1 Safety Information: Dangers . . . 1-6
  1.4.2 Safety Information: Warnings . . . 1-8
  1.4.3 Safety information: Cautions . . . 1-9
  1.4.4 General Information . . . 1-10
  1.4.5 What To Do in an Emergency . . . 1-12
  1.4.6 Reporting Accidents . . . 1-12
  1.4.7 Safety Information for Australia (For Australia Only) . . . 1-13
1.5 Privacy and Data Security . . . 1-14
1.6 Information on the Intranet . . . 1-15

2 System Data . . . 2-1
2.1 Overview . . . 2-1
2.2 HiPath 3000 . . . 2-2
  2.2.1 Introduction . . . 2-2
  2.2.2 Design and Dimensions of the HiPath 3000 Systems . . . 2-3
    2.2.2.1 Design and Dimensions of HiPath 3800 . . . 2-3
    2.2.2.2 Design and Dimensions of HiPath 3750 . . . 2-5
    2.2.2.3 Design and Dimensions of HiPath 3550 . . . 2-7
    2.2.2.4 Design and Dimensions of HiPath 3350 . . . 2-8
    2.2.2.5 Design and Dimensions of HiPath 3700 . . . 2-9
    2.2.2.6 Design and Dimensions of HiPath 3500 . . . 2-10
    2.2.2.7 Design and Dimensions of HiPath 3300 . . . 2-11
  2.2.3 System Environment of the HiPath 3000 Systems . . . 2-12
    2.2.3.1 HiPath 3800 System Environment . . . 2-12
    2.2.3.2 HiPath 3750 and HiPath 3700 System Environment . . . 2-13
    2.2.3.3 HiPath 3550 System Environment . . . 2-14
    2.2.3.4 HiPath 3350 System Environment . . . 2-15
    2.2.3.5 HiPath 3500 System Environment . . . 2-16
    2.2.3.6 HiPath 3300 System Environment . . . 2-17
2.3 HiPath 5000 . . . 2-18
2.4 System-Specific Capacity Limits for HiPath 3000, HiPath 5000 . . . 2-21
2.5 Technical Specifications for HiPath 3000 . . . 2-23
2.6 Interface-to-Interface Ranges . . . 2-24
2.7 Numbering Plan for HiPath 3000/5000 . . . 2-25
2.8 Technical Specifications and Compliance to HiPath 3000 . . . 2-26
  2.8.1 CE Compliance (Not for U.S.) . . . 2-26

2.8.2 Compliance with US and Canadian Standards (For U.S. and Canada Only) . . . 2-26
  2.8.2.1 FCC Compliance 2-27
    2.8.2.1.1 FCC Rules, Part 15 2-27
    2.8.2.1.2 FCC Rules, Part 68 2-27
  2.8.2.2 Industry Canada Compliance. 2-30
    2.8.2.2.1 REN. 2-30
    2.8.2.2.2 Equipment Attachment Limitations 2-30
2.8.3 SAFETY International 2-31
2.9 Environmental Conditions 2-32
2.9.1 Electrical Operating Conditions 2-32
2.9.2 Mechanical Operating Conditions. 2-32

3 Boards for HiPath 3000 3-1
3.1 Overview 3-1
3.2 Central Boards 3-18
3.2.1 CBCC 3-18
3.2.2 CBRC 3-25
3.2.3 CBCPR. 3-32
3.2.4 CBSAP 3-35
3.2.5 CMA 3-39
3.2.6 CMS 3-40
3.2.7 CR8N 3-44
3.2.8 CUC and CUCR 3-46
3.2.9 CUP and CUPR 3-47
3.2.10 DBSAP 3-48
3.2.11 IMODN 3-50
3.2.12 LIM 3-51
3.2.13 LIMS 3-54
3.2.14 LUNA2 3-56
3.2.15 MMC 3-65
3.2.16 PSUP 3-67
3.2.17 UPSC-D 3-68
3.2.18 UPSC-DR. 3-73
3.2.19 UPSM 3-79
3.3 Peripheral Boards 3-86
3.3.1 DIU2U (For U.S. Only) 3-86
3.3.2 DIUN2 3-90
3.3.3 HXGM3 3-94
3.3.4 HXGS3, HXGR3 3-100
3.3.5 IVML8, IVML24. 3-109
3.3.6 IVMNL, IVMN8 3-114
3.3.7 IVMP8 (not for U.S.), IVMP8R (not for U.S) 3-119
3.3.8 IVMS8, IVMS8R 3-124
3.3.9 PBXXX 3-130
3.3.10 SLA8N (not for U.S.), SLA16N, SLA24N 3-132

3.3.11 SLC16 (Not for U.S.), SLC16N (Not for U.S.) 3-139
3.3.12 SLCN (Not for U.S.) 3-156
3.3.13 SLMA, SLMA8 3-163
3.3.14 SLMO2, SLMO8 3-173
3.3.15 SLMO8 (Not for U.S.), SLMO24 3-183
3.3.16 SLU8 3-189
3.3.17 SLU8R 3-190
3.3.18 STLS2 (Not for U.S.), STLS4 3-191
3.3.19 STLS4R 3-198
3.3.20 STLSX2, STLSX4, STLSX4R 3-200
3.3.21 STMD3 3-205
3.3.22 STMD8 3-211
3.3.23 STMI2 3-221
3.3.24 TIEL. 3-227
3.3.25 TLA2 (Not for U.S.), TLA4 (Not for U.S.), TLA8 (Not for U.S.) 3-242
3.3.26 TLA4R (Not for U.S.) 3-244
3.3.27 TM2LP 3-246
3.3.28 TMAMF (for selected countries only) 3-253
3.3.29 TMC16 (U.S. Only) 3-257
3.3.30 TMCAS (for selected countries only). 3-262
3.3.31 TMDID (for U.S. only) 3-272
3.3.32 TMDID8 (for U.S. only) 3-277
3.3.33 TMEW2 3-280
3.3.34 TMGL4 (for U.S. only) 3-284
3.3.35 TMGL4R (for U.S. only). 3-286
3.3.36 TMGL8 (for U.S. only) 3-288
3.3.37 TML8W (Not for U.S.) 3-290
3.3.38 TMQ4 (for U.S. only) 3-293
3.3.39 TMST1 (for U.S. only) 3-295
3.3.40 TMS2 (Not for U.S.) 3-298
3.3.41 TST1 (for U.S. only) 3-305
3.3.42 TS2 (Not for U.S.), TS2R (Not for U.S.) 3-307
3.3.43 4SLA (Not for U.S.), 8SLA, 16SLA (Not for U.S.) 3-312
3.3.44 8SLAR. 3-315
3.4 Options 3-317
3.4.1 ALUM4 3-317
3.4.2 AMOM 3-321
3.4.3 ANI4 (for selected countries only) 3-323
3.4.4 ANI4R (for selected countries only) 3-327
3.4.5 Announcement and Music Modules 3-329
3.4.6 EVM 3-332
3.4.7 EXMNA (for U.S. only) 3-334
3.4.8 GEE8 (not for U.S) 3-336
3.4.9 GEE12 (nor for U.S.), GEE16 (not for U.S.), GEE50 (not for U.S.) 3-337

3.4.10 HOPE (for U.S. only) 3-339
3.4.11 OPAL and OPALR 3-341
3.4.12 PFT1 (Not for U.S.), PFT4 (Not for U.S.) 3-343
3.4.13 REAL 3-346
3.4.14 REALS 3-350
3.4.15 STBG4 (For France Only) 3-355
3.4.16 STRB, STRBR 3-356
3.4.17 V24/1 (not for U.S.) 3-361
3.4.18 V.24 Adapter 3-363
3.4.19 V.24 Cable 3-364

4 Installing HiPath 3000 4-1
4.1 Overview 4-1
4.2 Installing HiPath 3800 4-3
4.2.1 Installation Prerequisites 4-3
4.2.2 Installation Procedure 4-4
4.2.3 Installing HiPath 3800 (Standalone) 4-5
4.2.3.1 Selecting the Installation Site 4-5
4.2.3.1.1 For U.S. only: AC outlet 4-6
4.2.3.2 Unpacking the Components 4-7
4.2.3.3 Setting up the System Cabinets 4-8
4.2.3.3.1 Overview 4-8
4.2.3.3.2 Setting Up a Single Cabinet 4-9
4.2.3.3.3 Stacking Two Cabinets 4-10
4.2.3.3.4 Setting Up a Two-Cabinet System Side by Side 4-13
4.2.3.4 Grounding the System 4-15
4.2.3.4.1 Not for U.S.: Grounding the System 4-15
4.2.3.4.2 For U.S. Only: Grounding the System. 4-18
4.2.3.5 Checking the Grounding 4-20
4.2.4 Installing HiPath 3800 (19-Inch Cabinet) 4-21
4.2.4.1 Selecting the Installation Site 4-21
4.2.4.1.1 For U.S. only: AC outlet 4-24
4.2.4.2 Unpacking the Components 4-24
4.2.4.3 Mounting System Cabinets in the 19-Inch Cabinet 4-25
4.2.4.3.1 Mounting a System Cabinet using Support and Angle Brackets. 4-25
4.2.4.4 Grounding the System 4-28
4.2.4.5 Checking the Grounding 4-30
4.2.5 Installing Boards (Configuration Notes) 4-31
4.2.5.1 Board Slots in the Basic and Expansion Cabinet 4-31
4.2.5.2 Inserting or Removing Boards 4-34
4.2.5.3 Mounting Connector Panels (if required) 4-39
4.2.5.4 Installing the SIVAPAC-SIPAC Board Adapter 4-41
4.2.5.5 Initializing the Boards 4-44
4.2.5.6 Distribution of the PCM Highway 4-45
4.2.5.7 Static Traffic Capacity 4-48

4.2.6 Connecting the Cable to the Backplane 4-49
 4.2.6.1 Backplane of the Basic Cabinet 4-50
 4.2.6.2 Expansion Cabinet Backplane 4-53
 4.2.6.3 Connecting Cables Between the Basic and Expansion Cabinet 4-55
 4.2.6.4 Connecting Peripherals to the SIVAPAC Connector on the Backplane . . . 4-56
 4.2.6.5 Connecting Peripherals to the Connector Panels with RJ45 Jacks 4-59
 4.2.6.6 For U.S. only: Connecting Peripherals to the Connector Panels with CHAMP Jack 4-61
 4.2.6.7 Connecting Peripherals to the Connector Panels with SIPAC 1 SU Connectors 4-62
4.2.7 Using an External Main Distribution Frame or External Patch Panel 4-64
 4.2.7.1 Using an External Main Distribution Frame MDFU-E S30805-U5283-X . . . 4-65
  4.2.7.1.1 Mounting the Main Distribution Frame (MDFU-E) 4-66
  4.2.7.1.2 Laying the Line Network and Jumpers on the MDFU-E. 4-66
 4.2.7.2 Inserting the External Patch Panel S30807K6143-X 4-70
  4.2.7.2.1 Installing the Patch Panel in a 19-Inch Cabinet 4-71
  4.2.7.2.2 Connecting the Line Network to the External Patch Panel 4-72
 4.2.7.3 Inserting External S_0 Patch Panel C39104-Z7001-B3 4-74
  4.2.7.3.1 Installing the S_0 Patch Panel in the 19-Inch Cabinet 4-75
  4.2.7.3.2 Connecting Lines to the External S_0 Patch Panel 4-76
 4.2.7.4 For U.S. only: Connecting Network Facilities 4-78
4.2.8 Loading the System Software and Installing Subboards on the CBSAP 4-79
4.2.9 Connecting Workpoint Clients. 4-80
4.2.10 Making Trunk and Networking Connections 4-80
4.2.11 Performing a Visual Inspection 4-81
4.3 Installing HiPath 3750, HiPath 3700 4-83
4.3.1 Installation Prerequisites. 4-83
4.3.2 Installation Procedure 4-84
4.3.3 Installing HiPath 3750 4-86
 4.3.3.1 Selecting the Installation Site 4-87
  4.3.3.1.1 For U.S. only: AC outlet 4-88
 4.3.3.2 Unpacking the Components 4-89
 4.3.3.3 Install MDFU or MDFU-E (not for USA) 4-90
 4.3.3.4 Setting up the System Cabinets 4-91
  4.3.3.4.1 Overview 4-91
  4.3.3.4.2 Removing the Cabinet Covers 4-92
  4.3.3.4.3 Setting Up a Single Cabinet. 4-93
  4.3.3.4.4 Mounting a One-Cabinet System on the Wall (for U.S. only) 4-93
  4.3.3.4.5 Stacking Two Cabinets 4-95
  4.3.3.4.6 For U.S. only: Mounting Two Cabinets Stacked on the Wall 4-98
  4.3.3.4.7 Setting Up a Two-Cabinet System Side by Side 4-101
  4.3.3.4.8 Setting Up a Stacked Three-Cabinet System 4-102
  4.3.3.4.9 For U.S. only: Installing the Seismic Anchors 4-104
 4.3.3.5 Grounding the System 4-106

4.3.3.5.1 Not for U.S.: Grounding the System 4-106
4.3.3.5.2 For U.S. only: Grounding the System 4-109
4.3.3.6 Checking the Grounding 4-111
4.3.3.7 Connecting the Cable to the Backplane 4-112
4.3.3.7.1 Backplanes on the “8-Slot” Cabinets 4-112
4.3.3.7.2 Connection between the MDFU or MDFU-E and Backplane 4-117
4.3.3.8 Laying the Line Network and Setting Jumpers on the MDFU or MDFU-E. 4-122
4.3.3.8.1 For U.S. only: Connecting Network Facilities 4-126
4.3.4 Installing HiPath 3700 (19-Inch Cabinet) 4-127
4.3.4.1 Selecting the Installation Site. 4-128
4.3.4.1.1 For U.S. only: AC outlet 4-128
4.3.4.2 Unpacking the Components. 4-128
4.3.4.3 Mounting the System Cabinet in the 19-Inch Cabinet 4-129
4.3.4.3.1 Removing the Cabinet Covers 4-129
4.3.4.3.2 Mounting the System Cabinet with Angle Brackets. 4-131
4.3.4.4 Mounting the Patch Panel in the 19-Inch Cabinet 4-133
4.3.4.5 Grounding the System 4-134
4.3.4.6 Checking the Grounding 4-136
4.3.4.7 Connecting the Cable to the Backplane. 4-137
4.3.4.7.1 Backplanes on the “8-Slot” Cabinets 4-137
4.3.4.7.2 Connecting the Patch Panel and Backplane (in the 19-Inch Cabinet) 4-142
4.3.4.8 Connecting the Line Network to the Patch Panel 4-150
4.3.5 Loading the System Software and Installing Subboards on the CBCPR 4-151
4.3.6 Configuration notes 4-152
4.3.6.1 Inserting or Removing Boards 4-160
4.3.7 Connecting Workpoint Clients 4-161
4.3.8 Making trunk connections. 4-161
4.3.9 Performing a Visual Inspection. 4-162
4.4 Installing HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300. 4-163
4.4.1 Installation Prerequisites 4-163
4.4.2 Installation Procedure 4-164
4.4.3 Installing HiPath 3550 and HiPath 3350. 4-165
4.4.3.1 Selecting the Installation Site. 4-165
4.4.3.1.1 For U.S. only: AC outlet 4-167
4.4.3.2 Unpacking the Components 4-168
4.4.3.3 Not for U.S.: Mounting the Main Distribution Frame (HiPath 3550 only) . . . 4-168
4.4.3.4 Removing the System Housing Cover. 4-170
4.4.3.5 Attaching the System to the Wall. 4-172
4.4.3.6 Grounding the System and the Main Distribution Frame. 4-173
4.4.3.7 Installing the Boards 4-175
4.4.3.8 Laying the Line Network and Connection Cables 4-176
4.4.3.9 Attaching Ferrite 4-179

4.4.3.10 Configuration notes 4-181
4.4.3.11 Connecting Workpoint Clients 4-185
4.4.3.12 Making trunk connections 4-185
4.4.3.13 Performing a Visual Inspection 4-185
4.4.4 Installing HiPath 3500 and HiPath 3300 (19-Inch Housing) 4-186
4.4.4.1 Installation Versions 4-186
4.4.4.2 Selecting the Installation Site 4-187
4.4.4.2.1 For U.S. only: AC outlet 4-187
4.4.4.3 Unpacking the Components 4-188
4.4.4.4 Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall 4-189
4.4.4.5 Installing a HiPath 3500 or HiPath 3300 in a Cabinet 4-190
4.4.4.6 Grounding the System 4-192
4.4.4.7 Installing the Boards 4-193
4.4.4.8 Connecting Cables and the Line Network 4-194
4.4.4.9 Configuration notes 4-195
4.4.4.10 Connecting Workpoint Clients 4-198
4.4.4.11 Making trunk connections 4-198
4.4.4.12 Performing a Visual Inspection 4-198

5 Starting Up HiPath 3000 5-1
5.1 Overview 5-1
5.2 Starting Up HiPath 3800 5-2
5.2.1 Startup Procedure 5-2
5.2.2 Supplying the System with Power 5-3
5.2.2.1 Assigning Station Numbers 5-4
5.2.3 Carrying Out a System Reload 5-6
5.2.4 Carrying Out the Country Initialization and Selecting the Password Type 5-7
5.2.5 Not for U.S.: Entering the System Number 5-9
5.2.6 Customer-Specific Programming 5-10
5.2.7 Performing a System Check 5-10
5.3 Starting Up HiPath 3750 and HiPath 3700 5-11
5.3.1 Startup Procedure 5-11
5.3.2 Supplying the System with Power 5-12
5.3.2.1 Assigning Station Numbers 5-13
5.3.3 Carrying Out a System Reload 5-15
5.3.4 Carrying Out the Country Initialization and Selecting the Password Type 5-15
5.3.5 Not for U.S.: Entering the System Number 5-17
5.3.6 Customer-Specific Programming 5-18
5.3.7 Performing a System Check 5-18
5.4 Starting Up HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300 5-19
5.4.1 Startup Procedure 5-19
5.4.2 Supplying the System With Power 5-20
5.4.2.1 Assigning Station Numbers 5-21
5.4.3 Carrying Out a System Reload 5-23
5.4.4 Carrying Out the Country Initialization and Selecting the Password Type 5-23

5.4.5 Not for U.S.: Entering the System Number. 5-25
5.4.6 Customer-Specific Programming 5-26
5.4.7 Performing a System Check. 5-26

6 HiPath 5000 Startup and Administration 6-1
6.1 Overview 6-1
6.2 Introduction 6-2
6.3 Software Structure 6-5
6.4 Notes on Open Numbering in a HiPath 3000/5000 Network 6-8
6.5 Installation Requirements 6-9
6.5.1 Prerequisites for a Single-PC Solution 6-10
6.6 HiPath 5000 6-12
6.6.1 Preparing for Installation. 6-12
6.6.2 Integrating the HiPath 5000 Server in the Customer LAN 6-13
6.6.3 HiPath 5000 Installing Standard Components 6-14
6.6.3.1 Overview 6-14
6.6.3.2 Licensing 6-15
6.6.3.3 Starting the Installation 6-16
6.6.4 Installing HiPath ComScendo Service 6-21
6.6.4.1 Checking the Installation of the HiPath ComScendo Service 6-29
6.6.5 Installing HiPath Fault Management 6-30
6.6.6 Installing the TAPI Service Provider 6-34
6.6.7 Installing the HiPath Inventory Server Separately 6-35
6.6.8 Verifying Installation 6-40
6.6.8.1 Verifying the Start and Function of HiPath 5000 Services. 6-40
6.6.8.2 Checking Entries in the Event Viewer 6-41
6.7 Modifying HiPath 5000 Components (Retro-Fitting, Updating, Deleting) 6-42
6.8 Performing Licensing 6-44
6.9 Optimizing Operating System Settings 6-45
6.10 Perform HiPath 5000 Basic Configuration 6-47
6.10.1 Configuring HiPath 5000 with HiPath ComScendo Service 6-48
6.10.2 Configuring HiPath 5000 Server as a Central Administration Unit in an IP Network 6-49
6.10.2.1 Creating a Central Customer Database for IP Networking 6-49
6.10.2.2 Adding Individual Nodes for IP Networking 6-51
6.11 HiPath Manager PCM 6-53
6.12 GetAccount 6-54
6.12.1 Parameters for Call Data Export. 6-54
6.13 Connecting an Uninterruptible Power Supply to HiPath 5000 6-59

7 Starting HiPath 3000 as a Gateway 7-1
7.1 Overview 7-1
7.2 Introduction 7-1
7.3 Starting HiPath 3800 as a Gateway 7-2
7.3.1 Prerequisites. 7-2

7.3.2 Procedure for Installation and Startup. 7-2
7.4 Starting HiPath 3700 as a Gateway 7-4
7.4.1 Prerequisites 7-4
7.4.2 Procedure for Installation and Startup. 7-4
7.5 Starting HiPath 3500 as a Gateway. 7-6
7.5.1 Prerequisites 7-6
7.5.2 Procedure for Installation and Startup. 7-6
7.6 Starting HiPath 3300 as a Gateway. 7-8
7.6.1 Prerequisites 7-8
7.6.2 Procedure for Installation and Startup. 7-8

8 Licensing 8-1
8.1 Overview 8-1
8.2 Introduction 8-2
8.3 Licensing for HiPath 3000 V5.0, HiPath 5000 V5.0 8-4
8.3.1 Products and Components subject to Mandatory Licensing 8-4
8.3.2 Grace Period 8-6
8.3.3 License Failure Period 8-6
8.3.4 Performing Licensing 8-7
8.4 Licensing Scenarios 8-12
8.4.1 HiPath 3000 as a Standalone System. 8-12
8.4.2 Networked HiPath 3000 Systems without HiPath 5000 8-13
8.4.3 Networked HiPath 3000 Systems with HiPath 5000 8-14
8.4.4 Upgrading to HiPath 3000 V5.0, HiPath 5000 V5.0 8-17
8.4.5 Combining Standalone Systems (HiPath 3000) to Form a Network with HiPath 5000 8-20
8.4.6 Removing a Standalone System from a Network with HiPath 5000 8-22
8.4.7 Replacing License-sensitive Hardware (Changing the MAC Address) 8-23
8.5 Licensing optiClient Attendant 8-26
8.5.1 optiClient Attendant V7.0 Connected to HiPath 3000 V5.0. 8-26
8.5.2 optiClient Attendant V7.0 Connected to HiPath 3000 < V5.0 8-28
8.5.3 Upgrading optiClient Attendant V6.0 –> V7.0 As Part of an Upgrade to HiPath 3000 V5.0. 8-30
8.5.4 Upgrade optiClient Attendant V6.0 –> V7.0 on HiPath 3000 < V5.0. 8-32
8.5.5 Changing Licenses on an optiClient Attendant V7.0 As Part of an Upgrade to HiPath 3000 V5.0 8-34
8.6 Protection Against License Manipulation 8-36

9 Expanding and Upgrading HiPath 3000 9-1
9.1 Overview 9-1
9.2 Expanding HiPath 3000 9-2
9.2.1 Replacing Peripheral Boards for HiPath 3800 9-2
9.2.2 Replacing Peripheral Boards for HiPath 3750 and HiPath 3700 9-4
9.2.3 Connecting a printer 9-6
9.2.4 ECR with HiPath 3700, HiPath 3500, HiPath 3300 (not for U.S. and Canada) . . 9-8

9.2.4.1 ECR Control, Display, and Connecting Elements 9-9
9.2.4.2 Components. 9-12
9.2.4.3 Installation Options 9-12
9.2.4.4 Expansion Cabinet Rack ECR With Batteries 9-13
9.2.4.4.1 Installing Batteries. 9-15
9.2.4.5 Expansion Cabinet Rack ECR With Batteries and EPSU2-R 9-18
9.2.4.5.1 Connecting a Fan (if needed) 9-21
9.2.5 Connecting Special Equipment 9-24
9.2.5.1 Entrance Telephones. 9-24
9.2.5.1.1 Information on Third-Party Entrance Telephones 9-25
9.2.5.2 Connecting Speakers. 9-27
9.3 Upgrading HiPath 3000 to V5.0 9-29
9.3.1 Hardware Upgrade 9-29
9.3.2 Software Upgrade. 9-31

10 Workpoint Clients 10-1
10.1 Overview 10-1
10.2 optiPoint 500 10-3
10.2.1 optiPoint 500 Telephones 10-5
10.2.1.1 optiPoint 500 entry 10-5
10.2.1.2 optiPoint 500 economy (not for U.S.). 10-6
10.2.1.3 optiPoint 500 basic 10-7
10.2.1.4 optiPoint 500 standard, optiPoint 500 standard SL (For U.S. Only) 10-8
10.2.1.5 optiPoint 500 advance 10-10
10.2.1.6 Connection Requirements for HiPath 3000 10-12
10.2.1.7 Connection. 10-13
10.2.1.8 Connections on the Bottom of the Telephone 10-14
10.2.1.9 USB 1.1 Interface. 10-15
10.2.2 optiPoint 500 Add-On Devices 10-16
10.2.2.1 optiPoint Key Module 10-16
10.2.2.2 optiPoint BLF 10-17
10.2.2.3 Programming Add-On Devices 10-18
10.2.2.4 Possible Configurations for the Add-On Devices. 10-19
10.2.3 optiPoint 500 Adapters 10-20
10.2.3.1 optiPoint Analog Adapter 10-21
10.2.3.2 optiPoint ISDN Adapter 10-22
10.2.3.3 optiPoint Phone Adapter 10-23
10.2.3.4 optiPoint Acoustic Adapter 10-25
10.2.3.5 optiPoint Recorder Adapter 10-28
10.2.3.6 Possible optiPoint Adapter Configurations. 10-29
10.2.3.7 Comparison of optiset E adapters and optiPoint 500 adapters 10-30
10.2.4 Maximum Configuration for $U_{P0/E}$ Workpoint Clients, Add-On Devices and Adapters 10-31
10.3 optiPoint 600 office 10-33
10.4 optiLog 4me 10-36

10.5 optiset E Privacy Module 10-37
10.6 IP Telephony (Voice over IP) 10-38
  10.6.1 optiPoint 410 and optiPoint 420 10-40
    10.6.1.1 optiPoint 410 Telephones 10-41
      10.6.1.1.1 optiPoint 410 entry 10-41
      10.6.1.1.2 optiPoint 410 economy 10-43
      10.6.1.1.3 optiPoint 410 standard 10-45
      10.6.1.1.4 optiPoint 410 advance 10-47
    10.6.1.2 optiPoint 420 Telephones 10-49
      10.6.1.2.1 optiPoint 420 economy 10-49
      10.6.1.2.2 optiPoint 420 economy plus 10-51
      10.6.1.2.3 optiPoint 420 standard 10-53
      10.6.1.2.4 optiPoint 420 advance 10-55
    10.6.1.3 Connection and Startup 10-57
      10.6.1.3.1 Connections on the Bottom of the Telephone 10-58
    10.6.1.4 optiPoint 410 and optiPoint 420 Add-On Devices 10-60
      10.6.1.4.1 optiPoint SLK Module 10-60
      10.6.1.4.2 optiPoint 410 Display Module 10-61
      10.6.1.4.3 Possible Configurations for the Add-On Devices 10-63
    10.6.1.5 Use of optiPoint 500 Adapters 10-63
  10.6.2 optiClient 130 V5.0 10-64
  10.6.3 HiPath AP 1120 10-65
  10.6.4 HG 1500: Determining the Number of HG 1500 Boards Required 10-66
    10.6.4.1 Static Configuration Rules 10-66
    10.6.4.2 Dynamic Configuration Rules 10-68
      10.6.4.2.1 Gateway channels (DSP channels) 10-68
      10.6.4.2.2 MOH Channels (G.711, G.723, G.729) 10-69
      10.6.4.2.3 IP Networking Channels (PBX Networking Channels) 10-70
      10.6.4.2.4 DMC (Direct Media Connection) Channels 10-70
      10.6.4.2.5 ISDN Routing/PPP Channels 10-71
      10.6.4.2.6 Fax / Modem Channels 10-71
    10.6.4.3 Determining the Number of HG 1500 Boards Required 10-72
    10.6.4.4 Sample Calculation 10-75
      10.6.4.4.1 Calculation Example 1: 32 IP Networking Connections to HiPath 3750, HiPath 3700 10-75
      10.6.4.4.2 Calculation Example 2: 96 IP workpoint clients and 16 IP networking connections to HiPath 3750, HiPath 3700 10-76
      10.6.4.4.3 Calculation Example 3: 200 IP Workpoint Clients and Internet Access to HiPath 3750, HiPath 3700 10-77
      10.6.4.4.4 Calculation Example 4: IP Networking Connections and Voice over PPP (ISDN Routing) to HiPath 3750, HiPath 3700 10-79
      10.6.4.4.5 Calculation Example 5: Virtual Private Network VPN 10-80
      10.6.4.4.6 Calculation Example 6: Connecting teleworkers via VPN 10-82

10.6.4.4.7 Calculation Example 7: Virtual Private Network VPN with Customer Specifications: 1000 Kbps Bandwidth for Data Transfer, Remaining Bandwidth for Voice Transmission 10-84
10.6.4.5 Notes on the Maintenance of Gateway Channels HiPath 3000/5000 V5.0 or later 10-86
10.7 optiPoint Accessories 10-87
10.7.1 External AC Adapters 10-87
10.7.1.1 Local Power Supply for optiset E, optiPoint 500 and optiPoint 600 office 10-87
10.7.1.2 AC Adapter for optiPoint 410 and optiPoint 420 10-89
10.7.2 Headsets 10-90
10.8 Attendant console versions 10-92
10.8.1 optiPoint Attendant 10-92
10.8.2 optiClient Attendant 10-93
10.9 Mobile Telephones for HiPath Cordless Office 10-98
10.9.1 Gigaset S1 professional 10-98
10.9.2 Gigaset SL1 professional 10-99
10.9.3 Gigaset M1 professional 10-100
10.9.4 Gigaset active M 10-101
10.9.5 Gigaset active EX 10-102
10.9.6 Logging Mobile Telephones On To the System 10-104
10.9.6.1 Opening the HiPath 3000 Login Window 10-104
10.9.6.2 Logging On the Mobile Telephone. 10-105
10.9.6.3 Checking the Login Status of the Mobile Telephones 10-106
10.9.6.4 Replacing, Locking, and Logging Off a Mobile Telephone 10-106
10.10 Analog Telephones for HiPath 3000 10-107
10.11 ISDN Terminals for HiPath 3000. 10-108

11 HiPath Cordless Office 11-1
11.1 Overview 11-1
11.2 Introduction 11-2
11.3 System Configuration 11-3
11.4 Technical Data for Base Stations 11-4
11.5 Power-Related Capacity Limits 11-6
11.6 Multi-SLC and System-Wide Networking 11-10
11.7 Planning Notes for Networked HiPath 3000 Systems Featuring Network-Wide Roaming 11-12

12 Service 12-1
12.1 Overview 12-1
12.2 Service and Maintenance Tasks 12-3
12.2.1 Backing Up the Customer Database (CDB Backup) 12-3
12.2.1.1 Customer Data Backup Without HiPath Software Manager 12-3
12.2.1.1.1 Automatic Customer Data Backup 12-3
12.2.1.1.2 Manual Customer Data Backup with HiPath 3000 12-5

12.2.1.2 Customer Data Backup with HiPath Software Manager 12-6
12.2.1.3 CDB Treatment When Replacing Central HiPath 3000 Hardware 12-6
12.2.2 Effects of Hardware Changes on Customer Data 12-8
12.2.2.1 Inserting and Removing HiPath 3000 Boards. 12-8
12.2.2.2 Exchanging Workpoint Clients 12-10
12.2.3 Relocate/Transfer Application Processor Software (APS) 12-11
12.2.3.1 APS Replacement/Transfer for HiPath 3000 Systems Without HiPath Software Manager 12-11
12.2.3.1.1 Transferring an APS of HiPath 3000 by Replacing the MMC 12-11
12.2.3.1.2 APS transfer 12-12
12.2.3.2 APS Transfer for HiPath 3000 Systems With HiPath Software Manager 12-16
12.2.4 Upgrading HiPath 3000. 12-17
12.2.5 Determining System Information and Installed Software Components (HiPath Inventory Manager) 12-18
12.2.6 Backing Up System Components (Backup Manager) 12-19
12.2.7 HiPath User Management (not yet released) 12-21
12.3 Guided Maintenance 12-23
12.3.1 Diagnosis Options 12-23
12.3.1.1 Recording HiPath 3000 Board Status. 12-23
12.3.1.1.1 Central Control Boards. 12-23
12.3.1.1.2 Power Supplies 12-24
12.3.1.1.3 Peripheral Boards 12-24
12.3.1.2 Recording HiPath 3000 Trunk Status 12-26
12.3.1.3 Recording Station Status 12-27
12.3.1.4 Recording the Status of the HiPath 3000 V.24 Interfaces 12-28
12.3.1.5 Trace Options for HiPath 3000 12-29
12.3.1.6 HiPath Manager PCM Trace Monitor for HiPath 5000 12-30
12.3.1.6.1 HiPath Manager PCM Trace Monitor Applications. 12-30
12.3.1.6.2 Starting and Exiting the Trace Monitor. 12-31
12.3.1.6.3 The Screen Layout of the Trace Monitor 12-32
12.3.1.6.4 General Functions 12-34
12.3.1.6.5 Exporting Trace Windows 12-35
12.3.1.7 Eventlog for HiPath 3000 12-37
12.3.1.8 Testing Telephones 12-37
12.3.1.9 Event Viewer for HiPath 5000 (Eventlog) 12-38
12.3.1.10 HiPath 5000State Viewer 12-40
12.3.1.11 HiPath Fault Management 12-44
12.3.1.12 Licensing Analysis 12-45
12.3.1.12.1 Analysis Using Customer License Manager (CLM) 12-45
12.3.1.12.2 Analysis Using Customer License Agent (CLA). 12-45
12.3.1.13 Analysis Using HiPath Software Manager and HiPath Inventory Manager 12-46
12.3.2 HiPath 3000 Error Messages (Entries in the Eventlog for HiPath 3000) 12-48

12.3.3 HiPath 5000 Error Messages (Event Viewer Entries for HiPath 5000) 12-57
12.4 Correcting Errors 12-70
12.4.1 Automatic Error Correction 12-70
12.4.2 Manual Error Correction Without HiPath 3000 Manager E 12-70
12.4.3 Manual Error Correction With HiPath 3000 Manager E 12-71
12.5 Remote Service 12-72
12.5.1 HiPath 3000 Connection Options 12-73
12.5.2 HiPath 5000 Connection Options 12-74
12.5.3 Remote System Administration 12-74
12.5.3.1 Remote Administration of HiPath 3000 with HiPath 3000 Manager E . . . 12-74
12.5.3.2 DTMF Remote Administration of HiPath 3000 12-75
12.5.4 Remote Correction of System Software (APS) 12-75
12.5.5 Remote Error Signaling 12-76
12.5.6 Controlled Release of a Remote Connection 12-77
12.5.7 Remote Administration and Access Using PPP 12-77
12.5.7.1 Remote System Administration 12-77
12.5.7.2 Remote Administration of Plus Products 12-77
12.5.7.3 Remote Error Signaling Using SNMP 12-78
12.6 Security Features 12-79
12.6.1 Access Security 12-79
12.6.1.1 Logon With User Name and Password 12-79
12.6.1.2 Pre-Determined User Groups and Their Access Rights 12-82
12.6.1.3 System Access Options 12-84
12.6.1.4 Customer Data Security 12-85
12.6.2 Automatic Logging of Administration Procedures 12-86
12.6.2.1 Logging 12-86
12.6.2.1.1 Format Identification and Command Entry 12-86
12.6.2.2 Issuing and Saving Log Data 12-89

13 IP Fundamentals 13-1
13.1 Overview 13-1
13.2 IP Network Requirements 13-2
13.2.1 General Introduction 13-2
13.2.2 H.323 Protocol 13-2
13.2.3 Standards Supported 13-3
13.2.4 QoS - Quality of Service 13-4
13.3 Network analysis 13-6

A System Programming Codes (Expert Mode Codes) A-1

B Codes for Activating/Deactivating Features B-1

C IP Protocols and Port Numbers Used with HiPath 3000/5000 V5.0 . . . . . . C-1
C.1 HiPath 3000 . . . . . . C-2
C.2 HiPath 5000 . . . . . . C-3
C.3 HiPath ComScendo Service C-5
C.4 HiPath FM Managed Systems C-7

C.5 HG 1500 . . . . C-8
C.6 optiClient 130 V5.0 . . . . C-11
C.7 optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600 office. C-12
C.8 HiPath AP 1120 . . . . C-14
C.9 Middleware for Call Control C-15

D Identifying System Power Requirements D-1
D.1 HiPath 3800 Board Power Requirement D-2
D.2 HiPath 3750 and HiPath 3700 Board Power Requirement D-4
D.3 HiPath 3550 Board Power Requirement D-6
D.4 HiPath 3350 Board Power Requirement D-8
D.5 HiPath 3500 Board Power Requirement D-10
D.6 HiPath 3300 Board Power Requirement D-11
D.7 Workpoint Clients, Key Modules and Adapter Power Requirements D-12
D.8 Checking Whether the Output of a Power Supply Unit is Sufficient D-14
D.9 Identifying the Primary System Power Requirement. D-17

Figures W-1

Tables X-1

Abbreviations Y-1

Index Z-1

1 Important Information

1.1 Overview

Service Manual, HiPath 3000 V5.0, HiPath 5000 V5.0: P31003-H3550-S403-4-7620, 02/05 (ESHB.50.045.05.02.01)

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Structure of this Electronic Service Manual, page 1-2
Electrical Environment, page 1-4
Safety Information, page 1-5 ● Safety Information: Dangers ● Safety Information: Warnings ● Safety information: Cautions ● General Information ● What To Do in an Emergency ● Reporting Accidents ● Safety Information for Australia (For Australia Only)
Privacy and Data Security, page 1-14
Information on the Intranet, page 1-15

1.2 Structure of this Electronic Service Manual

Content and target group

This Electronic Service Manual (sSHB) provides information about the different systems of HiPath 3000/5000 V5.0 and later. The specifications contained therein only provide accompanying information and do not replace training.

> ⚠ **Warning**
> Only authorized service personnel are permitted to work on the system.

The information provided in this document contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the relevant characteristics shall only exist if expressly agreed in the terms of contract. The trademarks used are owned by Siemens AG or their respective owners.

Main topics of this manual

- **Chapter 2, "System Data"** provides information on the current HiPath 3000/5000 version and associated systems (characteristics, construction, system environment, capacity limits, technical data).
- **Chapter 3, "Boards for HiPath 3000"** describes all of the boards used for HiPath 3000. The hardware information (such as connection cables and NT connections) is presented for each board.
- The actions necessary for the standard installation (part of a standard system) of the different HiPath 3000 systems are described in **Chapter 4, "Installing HiPath 3000"**.
- The procedures for the startup of the individual HiPath 3000/5000 components are described in **Chapter 5, "Starting Up HiPath 3000"**, **Chapter 6, "HiPath 5000 Startup and Administration"** and **Chapter 7, "Starting HiPath 3000 as a Gateway"**.
- **Chapter 8, "Licensing"** provides information about the HiPath License Management.
- Information on supplementary equipment and expansions and on the procedure for upgrading HiPath 3000 systems are part of **Chapter 9, "Expanding and Upgrading HiPath 3000"**.
- **Chapter 10, "Workpoint Clients"** contains the description of the workpoint clients supported.
- Basic information about the operation of the HiPath Cordless Office are part of **Chapter 11, "HiPath Cordless Office"**.
- **Chapter 12, "Service"** describes the optional service and maintenance tasks and provides support for error detection and troubleshooting.

- Introductory information on the subject of IP can be found in **Chapter 13, "IP Fundamentals"**.
- The following appendices contain lists with programming codes, IP protocols, port numbers: **Appendix A, "System Programming Codes (Expert Mode Codes)"**, **Appendix B, "Codes for Activating/Deactivating Features"** and **Appendix C, "IP Protocols and Port Numbers Used with HiPath 3000/5000 V5.0"**.
- **Appendix D, "Identifying System Power Requirements"** provides information about the resource requirements of the boards and components of the HiPath 3000 systems.

1.3 Electrical Environment

HiPath telecommunication systems are approved for connection to TN-S power supply systems, but can also be connected to a TN-C-S power supply system in which the PEN conductor is divided into a ground and a neutral wire. TN-S and TN-C-S systems are defined in the IEC 364-3 standard.

The device conforms to the EU directive 1999/5/EG, as attested by the CE mark.

This device has been manufactured in accordance with our certified environmental management system (ISO 14001). This process ensures that energy consumption and the use of primary raw materials are kept to a minimum, thus reducing waste production.

1.4 Safety Information

The following information is intended for authorized service personnel. **Only** authorized service personnel are permitted to install and maintain the system.

Observe all safety regulations and read the warnings, cautions, and notes posted on the equipment. Familiarize yourself with emergency numbers.

Always consult a supervisor before starting work in conditions where the necessary safety precautions do not appear to be in place (such as in humid conditions or situations where there is a risk of gas explosions).

Safety symbols

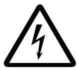
This manual uses the following symbols to indicate potential hazards:

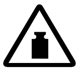
⚠	**Danger** This symbol warns that a situation may cause death or serious injury.
⚠	**Warning** This symbol indicates hazards which may lead to serious injury.
⚠	**Caution** This symbol indicates a risk of damage to hardware or software.

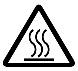
ℹ	This symbol identifies useful information.

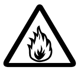
Additional symbols identifying sources of potential hazard

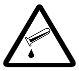
The following symbols are not generally used in the manual. They explain symbols that may appear on equipment.

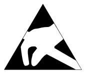

Electricity

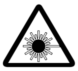

Weight


Heat


Fire


Chemicals


ESD*


Laser

* electrostatically sensitive devices

1.4.1 Safety Information: Dangers

Grounding

Never operate systems that require a ground wire connection without a ground wire connected. Connect the system to the ground wire correctly before starting up and connecting the stations.

Connecting an external battery pack, external batteries

Only use licensed battery packs and batteries.

HiPath 3500 and HiPath 3300 systems

Potentially hazardous circuits are accessible in HiPath 3500 and HiPath 3300 19" systems. These systems should therefore only be operated with closed housing.

Dangerous voltages

Voltages above 30 Vac (alternating current) or 60 Vdc (direct current) are dangerous.

Damage

- Replace the power cable immediately if it shows any signs of damage.
- Replace any damaged safety equipment (covers, labels and protective cables) immediately.

Accessories

Use only original accessories or components approved for the system. Failure to observe these instructions may damage the equipment or even violate safety and EMC regulations.

System shutdown during maintenance work

Procedures to be observed are described in the relevant chapters.

Working on electrical circuits

- Work on low-voltage electrical networks (100 to 240 Vac) must only be carried out by qualified personnel or authorized electrical engineers.
- Do not work alone. Work with another person who knows the locations of the power-off switches.
- Never touch live wires that are not properly insulated.
- Ensure that a machine cannot be powered on from another source or controlled from a different circuit breaker or disconnecting switch.
- Before starting any work, check whether the corresponding circuits are still on power. Never take it for granted that all circuits have reliably been disconnected from the power supply when a fuse or a main switch has been switched off.
- Use caution when installing or modifying telephone lines. Never install telephone wiring during an electrical storm.
- Expect leakage current from the telecommunications network.
- When performing work on an open system, ensure that it is never left unsupervised.

1.4.2 Safety Information: Warnings

Replacing the lithium battery

There is a risk of explosion if a lithium battery is not correctly replaced. It must only be replaced by an identical battery or one recommended by the manufacturer.

Replacing the batteries (DC power supply)

Procedures to be observed are described in the relevant chapters.

Protective clothing and equipment

- Do not wear loose clothing; tie back your hair while working on machines.
- Never wear rings, watches, and other jewelry or even clothing with metal coating or rivets when working with electrical circuits and components. These could cause injury and short circuits.
- Wear eye protection when you are working in any conditions that might be hazardous to your eyes.
- Always wear a hard hat where there is a risk of injury from falling objects.

General safety

- The surface of a mirror is conductive. Do not touch powered circuits with a mirror. To do so can cause personal injury and machine damage.
- Disconnect all power before working near power supplies unless otherwise instructed by a maintenance procedure.
- Do not attempt to lift objects that you think are too heavy for you.
- Never look directly at a laser beam.

1.4.3 Safety information: Cautions

Voltage checks and measurements

- Check the nominal voltage set for the equipment (operating instructions and type plate).
- High voltages capable of causing shock are used in this equipment. Be extremely careful when measuring high voltages and when servicing cards, panels, and boards while the system is powered on.

Damage

Only use tools and equipment which are in perfect condition. Do not use equipment with visible damage.

Protecting electrostatically sensitive devices (ESD)

To protect electrostatically sensitive devices (ESD):

- Wear a wristband before carrying out any work on PC boards and modules.
- Transport PC boards only in electrostatic packaging.
- Always place PC boards on a grounded surface before working on them.
- Only use grounded soldering irons.

Laying cables

Lay cables so as to prevent any risk of them being damaged or causing accidents, such as tripping.

1.4.4 General Information

Connecting lines

- All cables and lines leaving a system cabinet must be shielded between the connection point in the cabinet and, at the very least, the point at which they leave the cabinet.
  Use a clip and pressure screw to contact all braided shields to the cabinet outlet. This also applies to continuously connected service equipment.
- Connect all cables to the specified connection points only.

Location of safety equipment

When the installation or maintenance is completed, replace all safety equipment in the correct location.

Checking tools

Check your tools regularly. Only use intact tools.

Closing the housing cover

After maintenance and testing work has been completed, close all housing covers.

Condensation

Condensation may form if equipment is brought onto the operating premises from a cold environment. Wait until the temperature of the equipment has adjusted to the ambient temperature and is completely dry before starting it up.

Wall mounting

Some walls (such as plasterboard walls) have a reduced load-bearing capacity. Before starting wall mounting, check the load-bearing capacity of the walls.

Fire protection and EMC requirements

To ensure the legal fire protection and EMC requirements, operate the HiPath systems only when closed. You may open the system only briefly for assembly and maintenance work.

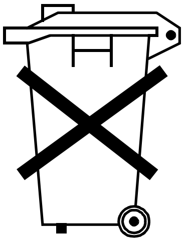
Flammable materials

- Do not store combustible gases or flammable materials in cabinets near the equipment installation site.
- Do not store documents, descriptions, operating instructions, and similar flammable materials in the cabinet.

Workplace hazards

- Ensure that the workplace is well lit.
- A neat workplace helps reduce the risk of accidents.

Battery disposal



Batteries are also included with the telephones and the equipment. Do not dispose of old or defective batteries along with normal household trash. Instead, drop them off at special sites intended for battery disposal. Observe country-specific regulations.

1.4.5 What To Do in an Emergency

Actions in emergencies

- Remain calm in the event of an accident.
- Disconnect the power before touching the victim.
- If you do not know how to disconnect the power, use a nonconducting object, such as a wooden broom handle, to push or pull the victim away from electrical contact.

First aid

- Be familiar with first aid for electrical shock. Familiarity with the various resuscitation methods required for breathing/heartbeat restoration and burn treatment are essential in emergencies of this kind.
- Administer resuscitation immediately if the person is not breathing (mouth-to-mouth or mouth-to-nose).
- If you are trained and certified, administer cardiac compression if the heart is not beating.

Calling for help

Immediately call an ambulance or the emergency doctor. Give details of the accident in the following order:

- Where did the accident happen?
- What happened?
- How many people were injured?
- What type of injuries were sustained?
- Be prepared to assist the emergency services with any supplementary information they may require.

1.4.6 Reporting Accidents

- Report all accidents, "near accidents", and possible hazards to your manager to ensure their causes are resolved as soon as possible.
- Report any electric shock, no matter how minor.

1.4.7 Safety Information for Australia (For Australia Only)

- Music on Hold and paging devices must be connected to the HiPath 3000 system via an ACA approved Line Isolation Unit.
- HiPath 3550 and HiPath 3350 must be installed near the mains socket outlet, which is powering the system. The mains socket shall be readily accessible. Integrity of the main socket must be assured.
- HiPath 3000 and HiPath 5000 may only be installed and maintained by authorized service personnel.
- HiPath 3550 and HiPath 3350 must be earthed with a separate bonding earth, if the systems are powered by a UPS.
- CE (customer equipment) does not continue to support emergency dialing after loss of mains power, if battery back up and power fail switchover to emergency analogue phones is not available.
- HiPath 3000/5000 must always be programmed to allow the dialing of emergency numbers (for example 000).

1.5 Privacy and Data Security

Handling personal data

This telephone system uses and processes personal data (as in call detail recording, telephone displays and customer data records).

In Germany, the processing and use of such data is subject to various regulations, including those of the Federal Data Protection Law (Bundesdatenschutzgesetz, BDSG). Observe all applicable laws in other countries.

The objective of privacy legislation is to prevent infringements of an individual's right to privacy based on the use or misuse of personal data.

By protecting data against misuse during all stages of processing, privacy legislation also protects the material interests of the individual and of third parties.

Guidelines applicable to Siemens AG employees

Employees of Siemens AG are bound to safeguard trade secrets and personal data under the terms of the company's work rules.

In order to ensure that the statutory requirements during service – whether on-site or remote – are consistently met, you should always observe the following regulations. This safeguards the interests of the customer and offers added personal protection.

Guidelines governing the handling of data

A conscientious and responsible approach helps protect data and ensure privacy:

- Ensure that only authorized persons have access to customer data.
- Use the password features of the system with no exceptions. Never give passwords to an unauthorized person orally or in writing.
- Ensure that no unauthorized person can ever process (store, modify, transmit, disable or delete) or use customer data.
- Prevent unauthorized persons from gaining access to data media (such as backup diskettes or log printouts). Access should also be prevented during service calls as well as when storing and transporting data.
- Ensure that data media which are no longer required are completely destroyed. Ensure that documents are not generally available.
- Work closely with your customer contact; this promotes trust and reduces your workload.

1.6 Information on the Intranet

Up-to-the-minute information on important topics is available on the Siemens intranet. Here is a selection:

Table 1-1 Information on the Intranet

Contents	Languages	URL
Product Overview Product descriptions	German English	http://opus1.mchh.siemens.de:8080/TopNet
Electronic Documentation on Com ESY Products Selection and download of the following: - Operating manuals - Administrator documentation - Service documentation - Sales documentation	German English French Italian Dutch Portuguese Spanish	https://netinfo2.icn.siemens.de/edoku3/search_de.htm
List of "Frequently Asked Questions (FAQ)" in the VD portal Questions and answers for HiPath customer scenarios: Keyword "Solutions_Products_Services"	German	http://vd-infochannel.icn.siemens.de/cfdocs/faq/start.cfm
Knowledge Management for Operational Support and Services KMOSS Platform for the provision of service information (successor to the Service Information System, SIS): - Tips & Tricks - Service information sorted according to products	English	https://kmoss.icn.siemens.de/livelink/livelink.exe
TAC Advisor Technical Assistance Center for enterprise and network partners: - Downloads - Software Maintenance Releases (SMR) - Configuration notes and alerts	English	http://tac.fld.rolm.com/
Setting up tracing for the Feature server Configuration notes and procedures	German English	https://kmoss.icn.siemens.de/livelink/livelink.exe/view/INF-02-000326

2 System Data

2.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
HiPath 3000, page 2-2
● Introduction, page 2-2 (electrical environment, systems)
● Design and Dimensions of the HiPath 3000 Systems, page 2-3: – Design and Dimensions of HiPath 3800 – Design and Dimensions of HiPath 3750 – Design and Dimensions of HiPath 3550 – Design and Dimensions of HiPath 3350 – Design and Dimensions of HiPath 3700 – Design and Dimensions of HiPath 3500 – Design and Dimensions of HiPath 3300
● System Environment of the HiPath 3000 Systems, page 2-12: – HiPath 3800 System Environment – HiPath 3750 and HiPath 3700 System Environment – HiPath 3550 System Environment – HiPath 3350 System Environment – HiPath 3500 System Environment – HiPath 3300 System Environment
HiPath 5000, page 2-18
System-Specific Capacity Limits for HiPath 3000, HiPath 5000, page 2-21
Technical Specifications for HiPath 3000, page 2-23
Interface-to-Interface Ranges, page 2-24
Numbering Plan for HiPath 3000/5000, page 2-25
Technical Specifications and Compliance to HiPath 3000, page 2-26
● CE Compliance (Not for U.S.), page 2-26
● Compliance with US and Canadian Standards (For U.S. and Canada Only), page 2-26
● SAFETY International, page 2-31
Environmental Conditions, page 2-32
● Electrical Operating Conditions, page 2-32
● Mechanical Operating Conditions, page 2-32

2.2 HiPath 3000

2.2.1 Introduction

Electrical environment

HiPath 3000 is intended for use in dwellings, businesses, and industry. When the system is operated in an industrial environment, additional measures may be necessary for ensuring immunity from electromagnetic radiation (refer to Section 2.9).

HiPath 3000 systems

This service manual contains information on all HiPath 3000 systems. Information on marketing individual models in different countries can be obtained at the responsible locations.

- System for standalone installation and for installation in 19-inch cabinets:
  - HiPath 3800
- Systems for standalone installation (HiPath 3750 only) and wall mounting:
  - HiPath 3750
  - HiPath 3550
  - HiPath 3350
- Systems for installation in 19-inch cabinets
  - HiPath 3700
  - HiPath 3500
  - HiPath 3300

Information on the capacity limits of the different HiPath 3000 systems is provided in Table 2-7.

2.2.2 Design and Dimensions of the HiPath 3000 Systems

2.2.2.1 Design and Dimensions of HiPath 3800

Two configurations

Depending on the requirements, HiPath 3800 can be used as:

- a single-cabinet system (basic cabinet BC)
- a two-cabinet system (BC + expansion cabinet EC)

Design

The basic cabinet BC has nine slots and the expansion cabinet EC has thirteen slots for peripheral boards. The common control board CBSAP has a fixed slot (slot 6, only in the BC).

Depending on your requirements, up to three LUNA2 power supply units can be used in the basic cabinet BC and up to four in the expansion cabinet EC.

Peripheral devices can be connected to the HiPath 3800 in a number of different ways:

- SIVAPAC connectors are available on the backplane for connecting the external main distribution frame MDFU-E using CABLUs (prefabricated cabling units) or to connect external patch panels.
- Connector panels with RJ45 jacks for connecting the peripheral device directly. The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- For U.S. only: connector panels with CHAMP jack for connecting the peripheral device directly. The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- Connector panels with SIPAC 1 SU connectors for connecting the external main distribution frame MDFU-E or external patch panels using CABLUs. The connector panels are clipped onto the SIVAPAC connectors on the backplane.

The type of connection used will be decided in consultation with the customer on conclusion of the agreement. The cabinets will be delivered accordingly with or without clipped-on connector panels.

Two installation options

HiPath 3800 is suitable for installation both as a standalone system and in a 19-inch cabinet.

Dimensions

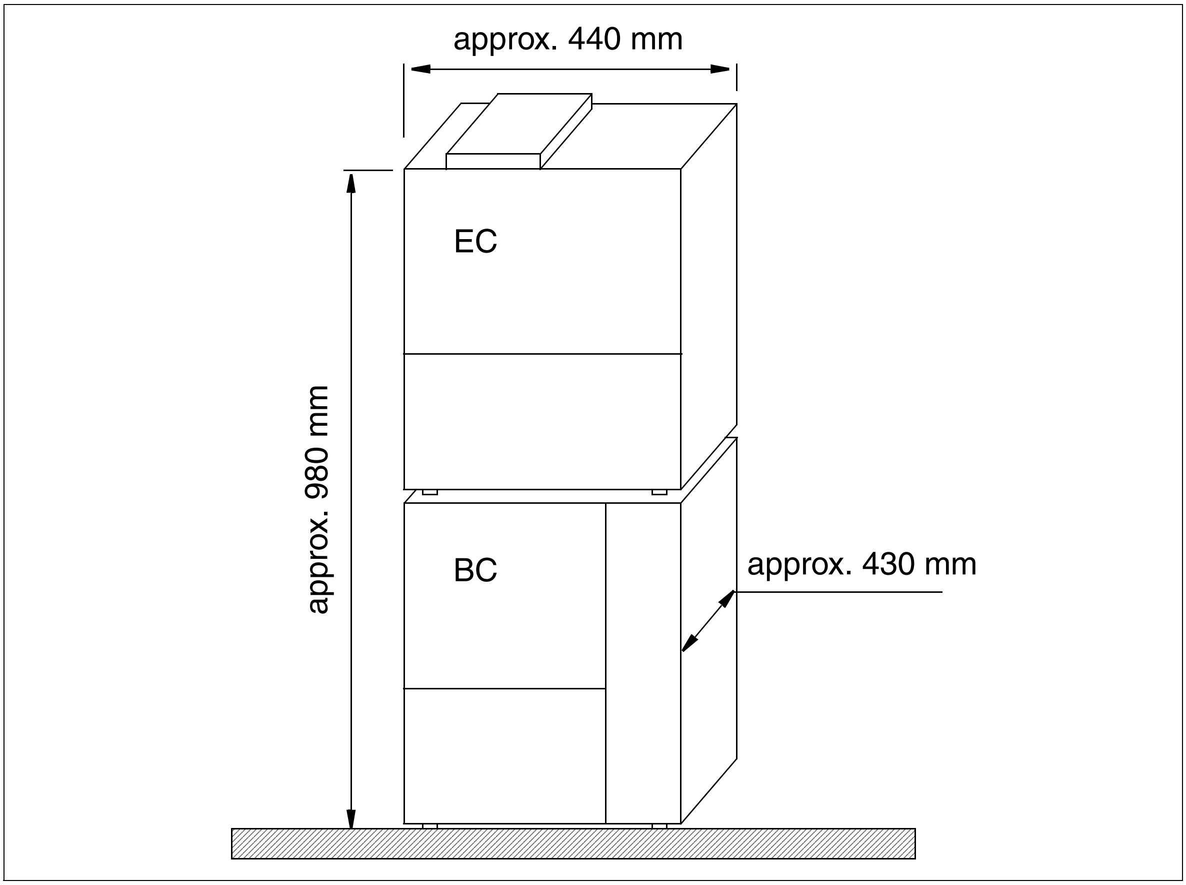

approx. 440 mm
EC
approx. 980 mm
BC
approx. 430 mm

Figure 2-1 HiPath 3800 Dimensions

2.2.2.2 Design and Dimensions of HiPath 3750

Three configurations

Depending on the requirements, HiPath 3750 can be used as:

- a single-cabinet system (BC)
- a two-cabinet system (BC + EC1)
- A three-cabinet system (BC + EC1 + EC2)

Design

The HiPath 3750 uses “8-slot” cabinets, where expansion cabinet 1 (EC1) and expansion cabinet 2 (EC2) are identical in design.

The BC has seven slots available for peripheral boards and each expansion cabinet has eight slots. The UPSM power supply (in all cabinets) and the CPCPR central control board (only in the BC) have fixed positions.

Up to two cabinets can be stacked.

A main distribution frame unit is needed to complete the communication system.

Dimensions

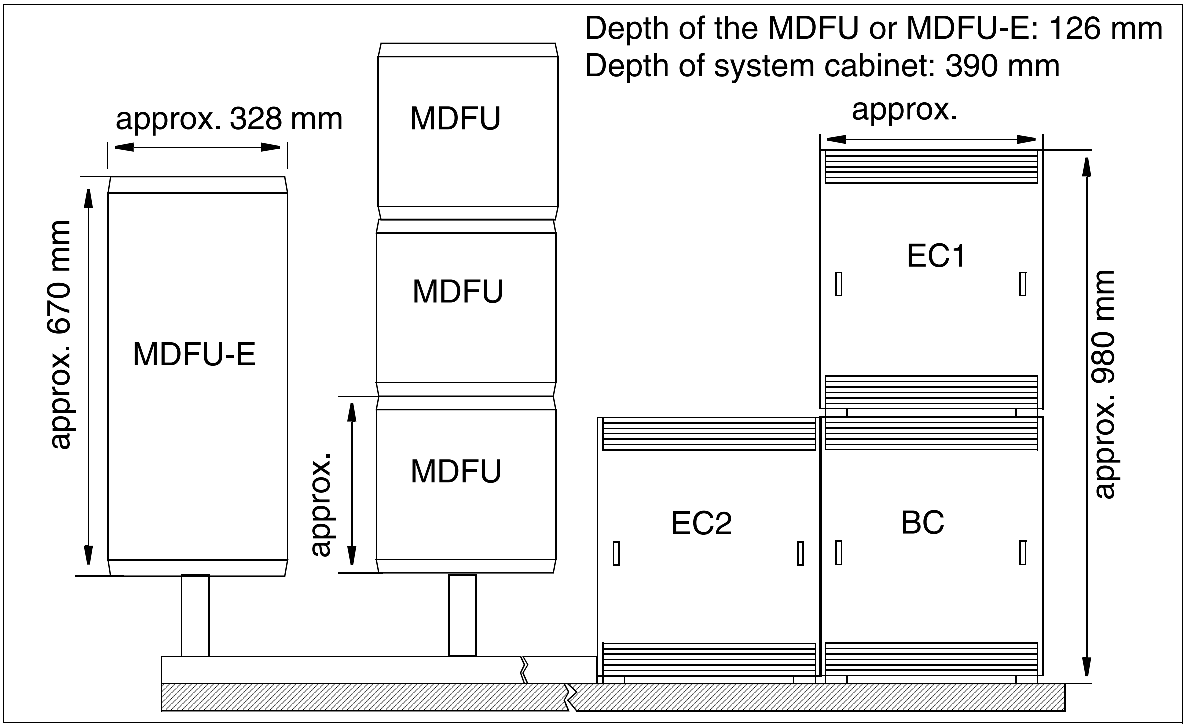

Depth of the MDFU or MDFU-E: 126 mm
Depth of system cabinet: 390 mm
approx. 328 mm
approx. 670 mm
MDFU-E
MDFU
MDFU
MDFU
approx.
approx.
EC1
EC2
BC
approx. 980 mm

Figure 2-2 HiPath 3750 Dimensions

2.2.2.3 Design and Dimensions of HiPath 3550

Design

The housing intended for wall mounting (Figure 2-3) HiPath 3550 contains one shelf with six slot levels. The slot levels (shown in Figure 4-103), numbered in ascending order from the attachment side, have the following assignments:

- Slot levels 1-3: peripheral boards (two slots per level).
- Slot level 4: CBCC control board only
- Slot level 5: SIPAC slot (for HiPath 3750 boards).
- Slot level 6: Optional boards (up to 5 modules)

The power supply is on the rear panel of the subrack.

The connection cables to the peripherals (telephones, trunk connections etc.) can be connected directly. Use an external MDFU in certain situations (CMI).

Dimensions

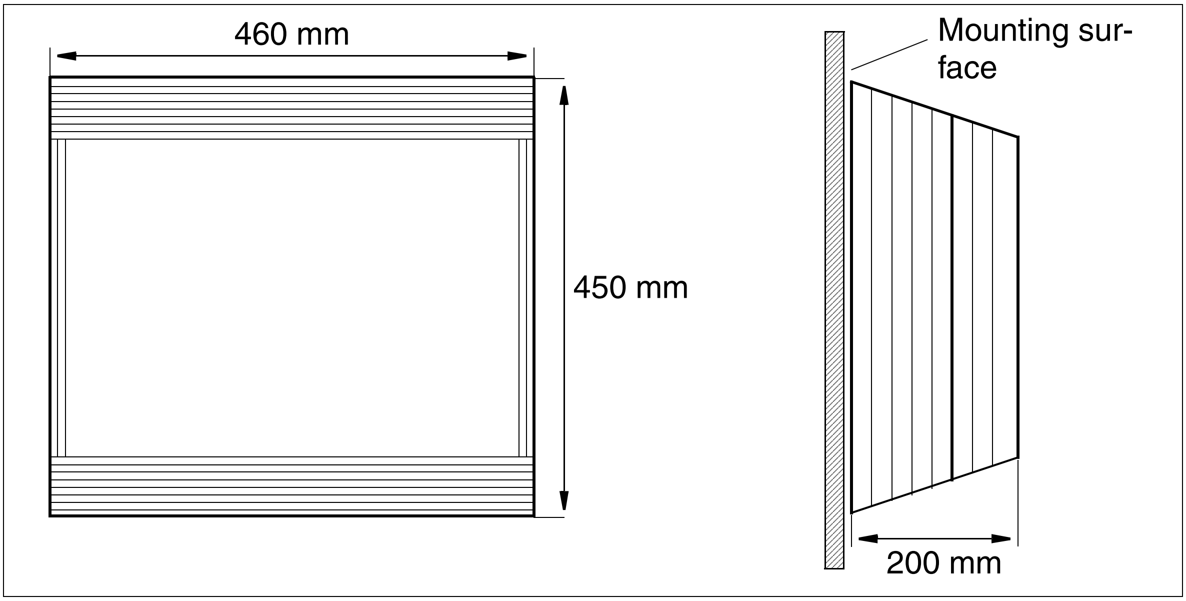


Figure 2-3 HiPath 3550 Dimensions

2.2.2.4 Design and Dimensions of HiPath 3350

Design

The housing intended for wall mounting (Figure 2-4)HiPath 3350 contains one shelf with three slot levels. The slot levels (shown in Figure 4-106), numbered in ascending order from the attachment side, have the following assignments:

- Slot level 1: peripheral boards (two slots)
- Slot level 2: CBCC control board only
- Slot level 3: Optional boards (up to 5 modules)

The power supply is on the rear panel of the subrack.

The HiPath 3350 does not need an external main distribution frame. The connection cables to the peripherals (telephones, trunk connections etc.) are directly connected to the boards.

Dimensions

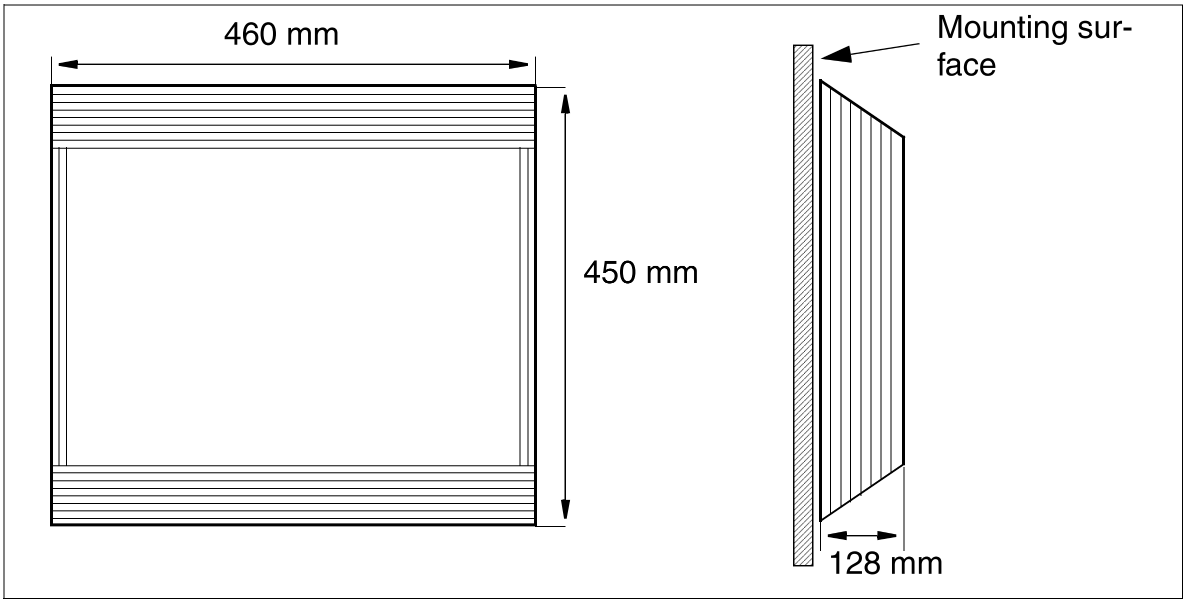


Figure 2-4 HiPath 3350 Dimensions

2.2.2.5 Design and Dimensions of HiPath 3700

Three configurations

Depending on the requirements, HiPath 3700 can be used as:

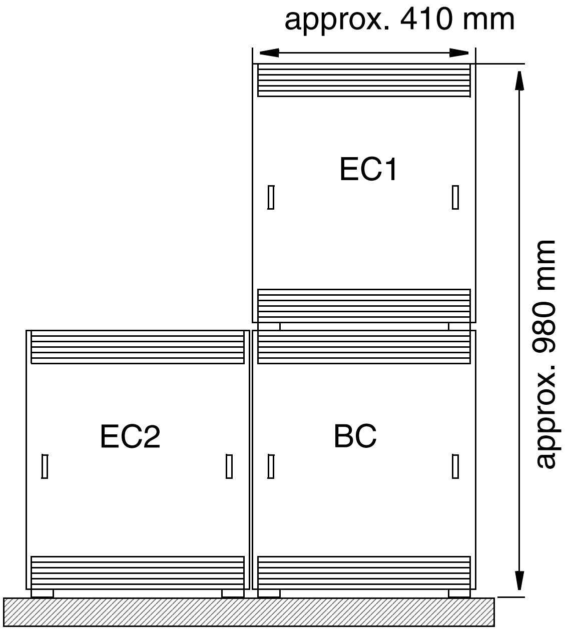
- a single-cabinet system (BC)
- a two-cabinet system (BC + EC1)
- a three-cabinet system (BC + EC1 + EC2), only when the 19-inch cabinets are next to one another and are accessible from the back.

A special mounting set enables installation in 19-inch cabinets.

Design

The HiPath 3700 uses “8-slot” cabinets. The BC has seven slots and the expansion cabinet has eight slots available for peripheral boards. The UPSM power supply (in all cabinets) and the CPCPR central control board (only in the BC) have fixed positions.

Dimensions



Depth of the system cabinet:
approx. 390 mm

Necessary height units per cabinet for 19-inch cabinet assembly: 11
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 2-5 HiPath 3700 Dimensions

2.2.2.6 Design and Dimensions of HiPath 3500

Design

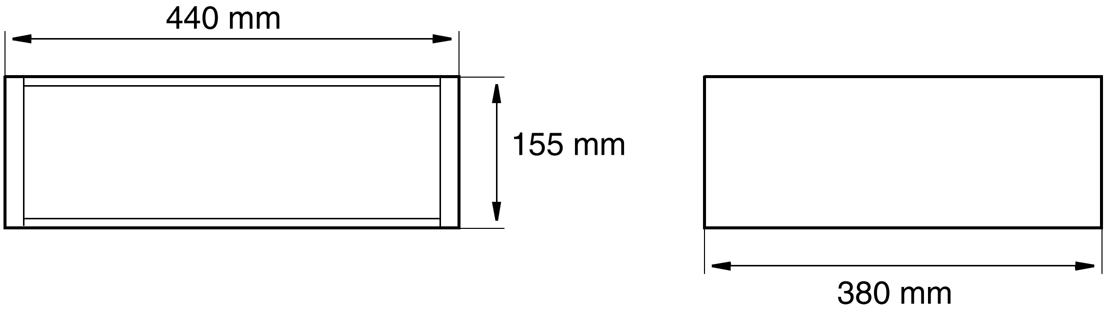
The housing intended for use with 19-inch cabinets (Figure 2-6) HiPath 3500 contains four slot levels with the following assignments (represented in Figure 4-111):

- Slot levels 1-3: slide-in shelves for peripheral boards (2 boards can be plugged in on each level)
- Slot level 4: slide-in shelf for CBRC control board
- Slot level 5: Optional boards (up to 3 modules)

The power supply is on the rear panel of the subrack.

The connection to peripherals (telephones, trunks, and others) is set up using MW8 jacks on the boards front cover.

Dimensions



Necessary height units for 19-inch cabinet assembly: 4
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 2-6 HiPath 3500 Dimensions

2.2.2.7 Design and Dimensions of HiPath 3300

Design

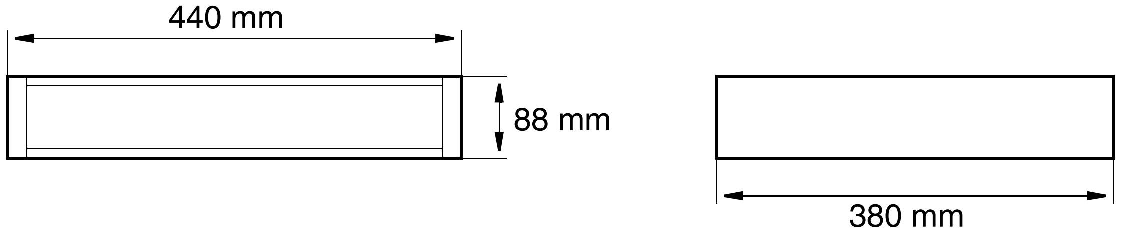
The housing intended for use with 19-inch cabinets (Figure 2-7)HiPath 3300 contains three slots with the following assignments (represented in Figure 4-112):

- Slot level 1: slide-in shelves for two peripheral boards
- Slot level 2: slide-in shelf for CBRC control board
- Slot level 3: Optional boards (up to 3 modules)

The power supply is on the rear panel of the subrack.

The connection to peripherals (telephones, trunks, and others) is set up using MW8 jacks on the board’s front cover.

Dimensions



Necessary height units for 19-inch cabinet assembly: 2
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 2-7 HiPath 3300 Dimensions

2.2.3 System Environment of the HiPath 3000 Systems

2.2.3.1 HiPath 3800 System Environment

Table 2-1 Boards for HiPath 3800

<table>
<tr><th colspan="6">HiPath 3800</th></tr>
<tr><th colspan="2">Subscriber Line Modules</th><th colspan="2">Central Boards Options</th><th colspan="2">Trunk Boards</th></tr>
<tr><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th></tr>
<tr><td colspan="2">IVMN8</td><td colspan="2">CBSAP</td><td></td><td>DIU2U</td></tr>
<tr><td colspan="2">IVMNL</td><td colspan="2">CMS</td><td colspan="2">DIUN2</td></tr>
<tr><td colspan="2">PBXXX</td><td colspan="2">DBSAP</td><td colspan="2">STMD3</td></tr>
<tr><td>SLCN</td><td></td><td colspan="2">IMODN</td><td colspan="2">STMI2</td></tr>
<tr><td colspan="2">SLMA</td><td colspan="2">LIMS</td><td colspan="2">TM2LP</td></tr>
<tr><td colspan="2">SLMA8</td><td colspan="2">LUNA2</td><td></td><td>TMC16</td></tr>
<tr><td colspan="2">SLMO2</td><td colspan="2">MMC</td><td></td><td>TMDID</td></tr>
<tr><td colspan="2">SLMO8</td><td colspan="2">MPPI</td><td colspan="2">TMEW2</td></tr>
<tr><td colspan="2">STMD3</td><td colspan="2">PDMX[1]</td><td></td><td></td></tr>
<tr><td colspan="2">STMI2</td><td>PFT1/PFT4</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">REALS</td><td></td><td></td></tr>
</table>

[1] used on the STMI2 board.

2.2.3.2 HiPath 3750 and HiPath 3700 System Environment

Table 2-2 Boards for HiPath 3750 and HiPath 3700

HiPath 3750 and HiPath 3700 systems					
Subscriber Line Modules		**Central Boards Options**		**Trunk Boards**	
ROW	**U.S.**	**ROW**	**U.S.**	**ROW**	**U.S.**
HXGM3		CBCPR		HXGM3	
IVML8		CMS		STMD8	
IVML24		CR8N			TMDID8
SLA8N		IMODN		TIEL	
SLA16N		LIM		TML8W	TMGL8
SLA24N		MMC		TMS2	TMST1
SLC16		UPSM		TMAMF[1]	
SLC16N				TMCAS[2]	
SLMO8		GEE8			
SLMO24		MPPI			
STMD8		PDM1			
		PFT1/PFT4			
		REAL			

[1] for Brazil, India, Malaysia, Singapore and ATEA countries only

[2] for selected countries only

2.2.3.3 HiPath 3550 System Environment

Table 2-3 Boards for HiPath 3550

<table>
<tr><th colspan="6">HiPath 3550</th></tr>
<tr><th colspan="2">Subscriber Line Modules</th><th colspan="2">Central Boards Options</th><th colspan="2">Trunk Boards</th></tr>
<tr><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th></tr>
<tr><td colspan="2">HXGS3</td><td colspan="2">CBCC</td><td colspan="2">HXGS3</td></tr>
<tr><td colspan="2">IVMS8</td><td>CMA</td><td></td><td>STLS2</td><td></td></tr>
<tr><td>SLA8N</td><td></td><td colspan="2">CMS</td><td colspan="2">STLS4</td></tr>
<tr><td colspan="2">SLA16N</td><td colspan="2">CUC</td><td colspan="2">STLSX2</td></tr>
<tr><td colspan="2">SLA24N</td><td colspan="2">IMODN</td><td colspan="2">STLSX4</td></tr>
<tr><td>SLC16</td><td></td><td colspan="2">LIM</td><td>TLA2</td><td>TMGL4</td></tr>
<tr><td>SLC16N</td><td></td><td colspan="2">MMC</td><td>TLA4</td><td>TMQ4</td></tr>
<tr><td colspan="2">SLMO24</td><td colspan="2">UPSC-D</td><td>TLA8</td><td>TST1</td></tr>
<tr><td colspan="2">SLU8</td><td colspan="2"></td><td>TMAMF[1]</td><td></td></tr>
<tr><td>STLS2</td><td></td><td colspan="2">ALUM4</td><td>TMCAS[2]</td><td></td></tr>
<tr><td colspan="2">STLS4</td><td colspan="2">ANI4[2]</td><td>TS2</td><td></td></tr>
<tr><td colspan="2">STLSX2</td><td colspan="2">EVM</td><td></td><td></td></tr>
<tr><td colspan="2">STLSX4</td><td colspan="2">EXM</td><td></td><td></td></tr>
<tr><td>4SLA</td><td></td><td>GEE12</td><td>EXMNA</td><td></td><td></td></tr>
<tr><td colspan="2">8SLA</td><td>GEE16</td><td></td><td></td><td></td></tr>
<tr><td>16SLA</td><td></td><td>GEE50</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>UAM</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>MPPI</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">OPAL</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">PDM1</td><td></td><td></td></tr>
<tr><td></td><td></td><td>STBG4[3]</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">STRB</td><td></td><td></td></tr>
<tr><td></td><td></td><td>V24/1</td><td></td><td></td><td></td></tr>
</table>

[1] for Brazil, India, Malaysia, Singapore and ATEA countries only
[2] for selected countries only
[3] For France only

2.2.3.4 HiPath 3350 System Environment

Table 2-4 Boards for HiPath 3350

<table>
<tr><th colspan="6">HiPath 3350</th></tr>
<tr><th colspan="2">Subscriber Line Modules</th><th colspan="2">Central Boards Options</th><th colspan="2">Trunk Boards</th></tr>
<tr><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th></tr>
<tr><td colspan="2">HXGS3</td><td colspan="2">CBCC</td><td colspan="2">HXGS3</td></tr>
<tr><td>IVMP8</td><td></td><td>CMA</td><td></td><td>STLS2</td><td></td></tr>
<tr><td colspan="2">IVMS8</td><td colspan="2">CMS</td><td colspan="2">STLS4</td></tr>
<tr><td colspan="2">SLU8</td><td colspan="2">CUP</td><td colspan="2">STLSX2</td></tr>
<tr><td>STLS2</td><td></td><td colspan="2">IMODN</td><td colspan="2">STLSX4</td></tr>
<tr><td colspan="2">STLS4</td><td colspan="2">LIM</td><td>TLA2</td><td>TMGL4</td></tr>
<tr><td colspan="2">STLSX2</td><td colspan="2">MMC</td><td>TLA4</td><td>TMQ4</td></tr>
<tr><td colspan="2">STLSX4</td><td colspan="2">PSUP</td><td>TLA8</td><td></td></tr>
<tr><td>4SLA</td><td></td><td colspan="2">UPSC-D</td><td></td><td></td></tr>
<tr><td colspan="2">8SLA</td><td colspan="2"></td><td></td><td></td></tr>
<tr><td>16SLA</td><td></td><td colspan="2">ALUM4</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">ANI4[1]</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">EVM</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">EXM</td><td></td><td></td></tr>
<tr><td></td><td></td><td>GEE12</td><td>EXMNA</td><td></td><td></td></tr>
<tr><td></td><td></td><td>GEE16</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>GEE50</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>UAM</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>MPPI</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">OPAL</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">PDM1</td><td></td><td></td></tr>
<tr><td></td><td></td><td>STBG4[2]</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">STRB</td><td></td><td></td></tr>
<tr><td></td><td></td><td>V24/1</td><td></td><td></td><td></td></tr>
</table>

[1] for selected countries only

[2] For France only

2.2.3.5 HiPath 3500 System Environment

Table 2-5 Boards for HiPath 3500

<table>
<tr><th colspan="6">HiPath 3500</th></tr>
<tr><th colspan="2">Subscriber Line Modules</th><th colspan="2">Central Boards Options</th><th colspan="2">Trunk Boards</th></tr>
<tr><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th></tr>
<tr><td colspan="2">HXGR3</td><td colspan="2">CBRC</td><td colspan="2">HXGR3</td></tr>
<tr><td colspan="2">IVMS8R</td><td>CMA</td><td></td><td colspan="2">STLS4R</td></tr>
<tr><td colspan="2">SLU8R</td><td colspan="2">CMS</td><td colspan="2">STLSX4R</td></tr>
<tr><td colspan="2">STLS4R</td><td colspan="2">CUCR</td><td>TS2R</td><td>TMGL4R</td></tr>
<tr><td colspan="2">STLSX4R</td><td colspan="2">IMODN</td><td>TLA4R</td><td>TST1</td></tr>
<tr><td colspan="2">8SLAR</td><td colspan="2">LIM</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">MMC</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">UPSC-DR</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2"></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">ANI4R[1]</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">EVM</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">EXMR</td><td></td><td></td></tr>
<tr><td></td><td></td><td>MPPI</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">OPALR</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">PDM1</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">STRBR</td><td></td><td></td></tr>
<tr><td></td><td></td><td>UAMR</td><td></td><td></td><td></td></tr>
</table>

[1] for selected countries only

2.2.3.6 HiPath 3300 System Environment

Table 2-6 Boards for HiPath 3300

<table>
<tr><th colspan="6">HiPath 3300</th></tr>
<tr><th colspan="2">Subscriber Line Modules</th><th colspan="2">Central Boards Options</th><th colspan="2">Trunk Boards</th></tr>
<tr><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th><th>ROW</th><th>U.S.</th></tr>
<tr><td colspan="2">HXGR3</td><td colspan="2">CBRC</td><td colspan="2">HXGR3</td></tr>
<tr><td>IVMP8R</td><td></td><td>CMA</td><td></td><td colspan="2">STLS4R</td></tr>
<tr><td colspan="2">IVMS8R</td><td colspan="2">CMS</td><td colspan="2">STLSX4R</td></tr>
<tr><td colspan="2">SLU8R</td><td colspan="2">CUPR</td><td>TLA4R</td><td>TMGL4R</td></tr>
<tr><td colspan="2">STLS4R</td><td colspan="2">IMODN</td><td></td><td></td></tr>
<tr><td colspan="2">STLSX4R</td><td colspan="2">LIM</td><td></td><td></td></tr>
<tr><td colspan="2">8SLAR</td><td colspan="2">MMC</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">UPSC-DR</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2"></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">ANI4R[1]</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">EVM</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">EXMR</td><td></td><td></td></tr>
<tr><td></td><td></td><td>MPPI</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">OPALR</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">PDM1</td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">STRBR</td><td></td><td></td></tr>
<tr><td></td><td></td><td>UAMR</td><td></td><td></td><td></td></tr>
</table>

[1] for selected countries only

2.3 HiPath 5000

HiPath 5000 is operated as a central administration unit in an IP network of HiPath 3000 systems. By creating a "Single System Image", all relevant nodes can be centrally administered.

HiPath 5000 is the platform for providing applications at a central point and enables them to be used by all stations in the IP network.

The HiPath ComScendo Service also supports the use of an integrated gatekeeper as well as features for IP workpoint clients from HiPath ComScendo. Up to 1000 registered IP workpoint clients and up to 250 CorNet IP lines (CorNet NQ protocol tunneled in H.323 via Annex M1) are supported in this process.

The HiPath ComScendo Service is virtually a complete HiPath 3000 node that is only configured as software on a PC. Apart from TDM-specific features (e.g. the connection of $U_{P0/E}$ stations, trunks and special stations such as door openers, etc.), all V5.0 features are available. The HiPath ComScendo Service is administered over HiPath 3000 Manager E, while the HG 1500 resources (see Page 10-38) are administered over Web-based Management (WBM).

Cross-platform use of HiPath ComScendo features (IP networking), for example in conjunction with HiPath 4000, is implemented via CorNet-IP (CorNet-NQ protocol tunnelled in H.323 via annex M1). HG 1500 in HiPath 3000 and HG3550 V2.0 in HiPath 4000 are prerequisites for IP networking over CorNet IP.

Parts of the following setup for HiPath 5000 are optional and can be installed both on the HiPath 5000 server and on a separate PC.

- Feature Server (central administration service in a HiPath 3000/5000 network)
- Presence Manager (service for LED signaling of call processing station statuses and network-wide DSS keys)
- HiPath ComScendo Service (gatekeeper and HiPath ComScendo features for IP workpoint clients)
- HiPath 3000 Manager E (MS Windows-based tool for the administration of all service and customer-specific data by Service)
- HiPath 3000 Manager C (MS Windows-based tool for the administration of customer-specific data by the customer)
- HiPath Software Manager (Web-based tool for upgrades (Upgrade Manager for HiPath ComScendo Service and HG 1500) and backups (Backup Manager for HiPath ComScendo Service, HG 1500 and databases))
- Inventory Manager (service for detecting software components installed and system information in a HiPath 3000/5000 network)
- Customer License Agent CLA (service for analyzing and decrypting a HiPath License Management license file)

- Central License Manager CLM (CLA front-end for reading in licenses in online and offline mode)
- Personal Call Manager PCM (Web-based application for the configuration and administration of personal call forwarding operations)
- HiPath FM Desktop V3.0 (Java-based application for error signaling)
- GetAccount (application that prepares generated call data records for further processing.)

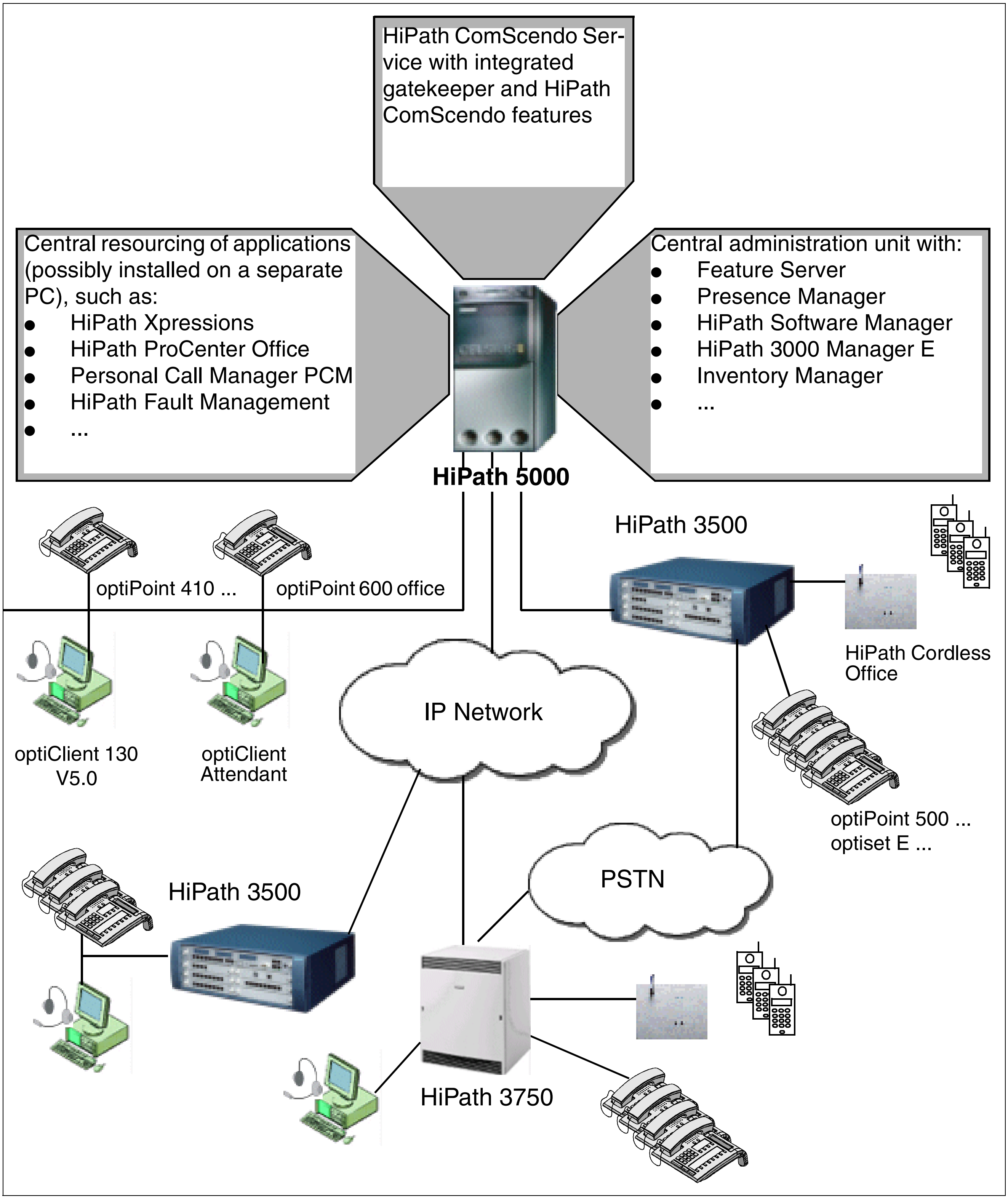

HiPath ComScendo Service with integrated gatekeeper and HiPath ComScendo features
Central resourcing of applications (possibly installed on a separate PC), such as:
● HiPath Xpressions
● HiPath ProCenter Office
● Personal Call Manager PCM
● HiPath Fault Management
● ...
Central administration unit with:
● Feature Server
● Presence Manager
● HiPath Software Manager
● HiPath 3000 Manager E
● Inventory Manager
● ...
HiPath 5000
HiPath 3500
optiPoint 410 ...
optiPoint 600 office
HiPath Cordless Office
optiClient 130 V5.0
optiClient Attendant
IP Network
optiPoint 500 ...
optiset E ...
PSTN
HiPath 3500
HiPath 3750

Figure 2-8 HiPath 5000 Multi-Node IP System

2.4 System-Specific Capacity Limits for HiPath 3000, HiPath 5000

The maximum capacity limits are calculated based on the following assumptions:

- HiPath 3800: 2 board slots are reserved for trunks.
- HiPath 3750, HiPath 3700: 3 board slots are reserved for trunks.
- HiPath 3550, HiPath 3500: Two S_0 interfaces on the central board + 1 board slot are reserved for trunks.
- HiPath 3350, HiPath 3300: Two S_0 interfaces on the central board are reserved for trunks.
- Traffic capacity: 0.15 Erlang

Capacity limits which deviate from these may be specified for sales purposes.

Table 10-3 contains the maximum system-specific configurations for $U_{P0/E}$ workpoint clients and the corresponding key modules and adapters.

Table 2-7 HiPath 3000/5000 - System-Specific Capacity Limits (Maximum Configuration)

System			**HiPath 3800**[1]	**HiPath 3750 HiPath 3700**	**HiPath 3550**	**HiPath 3500**	**HiPath 3350**	**HiPath 3300**	**HiPath Com-Scendo service**
Stations/Workpoint Clients	**Total Number of TDM and IP Stations**[2]		500	250/500[3]	192[4]	192[5]	96[6]	96[7]	–
	IP stations (system clients, H.323 clients)		500	250/500[3]	192[8]	192[8]	96[8,9]	96[8,10]	1000
	Total number of TDM stations[2]		384	250/384[3]	96[11]	77[11,12]	57[13]	41[14]	–
	TDM Stations	Analog stations	384	250/384[15]	96[2]	44[16]	36[17]	20[18]	–
		$U_{P0/E}$ stations	384	250/384[3]	72[19]	48[20]	24[21]	24[22]	–
		Additional stations via adapter (phone adapter/analog adapter/ISDN adapter)	116	116[3,23]	48[11]	29[11]	24[24]	24[24]	–
		Cordless stations	250	250	64/32[25,26]	32	16	16	–
Base Stations for HiPath Cordless Office			64	64	16/7	7	3	3	–
Lines	**Total Number of Lines**		250	90/250[3]	60	60	16	16	–
	Total number of analog trunks and network trunks		120	90/120[3]	60	60	16	8	–
	Total number of digital trunk B-channels and digital network line B channels (S_0, S_{2M})		180	90/180[3]	60	60	16	16	–
	CorNet-IP network trunks		128	90/128[3]	60	60	16	16	250
HG 1500 boards			8	8	3	3	1 (2[27])	1 (2[27])	–
Gateway channels to the system			128	128	48	48	16	16	–

1. Testing is not required on stations and lines up to the maximum configuration. Testing using the project planning tool is mandatory for configurations which include UCD/ACD, more than one SLCN, or groups of more than 10 stations (intranet: http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index.htm).
2. Only configurations that do not exceed this limit will be supported.
3. Depending on the system configuration and performance, the specified capacity limits may not always be achieved. To ensure that the dynamic capacity limit of HiPath 3750 or HiPath 3700 is not exceeded, the configuration can be tested using the project planning tool (intranet: http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index.htm). Testing is not required for configurations of up to 250 stations and 90 lines. Testing using the project planning tool is mandatory for configurations which include UCD/ACD, more than one SLC16/SLC16N, or groups of more than 10 stations.
4. Up to 96 of the 192 stations can be TDM stations.
5. Up to 61 of the 192 stations can be TDM stations (4xa/b + 1x$U_{P0/E}$ + 7xBS/32xHiPath Cordless Office stations at the central board + 3xSLU8R or 3x8SLAR).
6. Up to 41 of the 96 stations can be TDM stations (4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 1x16SLA).
7. Up to 33 of the 96 stations can be TDM stations (4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 1xSLU8R or 1x8SLAR).
8. These are administrative capacity limits.
9. Due to the power consumption of HG 1500, a UPSC-D must be used.
10. Due to the power consumption of HG 1500, a UPSC-DR must be used.
11. If the total number of $U_{P0/E}$ stations, analog stations and additional stations connected using an adapter is greater than 72, an external EPSU2 power supply unit must be used.
12. 4xa/b + 1x$U_{P0/E}$ + 7xBS/32xHiPath Cordless Office stations at the central board + 5xSLU8R or 5x8SLAR.
13. 4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 2x16SLA.
14. 4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 2xSLU8R or 2x8SLAR.
15. Testing using the project planning tool is not required for configurations of up to 384 analog stations, no other station types, and 90 lines. Configurations that contain UCD/ACD or more than one SLC16/SLC16N or groups with more than ten stations should always be checked using the project planning tool (intranet: http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index.htm).
16. 4xa/b at the central board + 5x8SLAR.
17. 4xa/b at the central board + 2x16SLA.
18. 4xa/b at the central board + 2x8SLAR.
19. 8x$U_{P0/E}$ at the central board + 5xSLU8 + 1xSLMO24.
20. 8x$U_{P0/E}$ at the central board + 5xSLU8R.
21. 8x$U_{P0/E}$ at the central board + 2xSLU8.
22. 8x$U_{P0/E}$ at the central board + 2xSLU8R.
23. The total number of $U_{P0/E}$ stations and additional stations connected using an adapter is limited to 384.
24. If the total number of $U_{P0/E}$ stations and additional stations connected using an adapter is greater than 24, a UPSC-D/UPSC-DR must be used.
25. Due to the 5-V power supply unit, one SLC16/SLC16N and a maximum of two HG 1500 V3.0 boards can be used.
26. 64 HiPath Cordless Office stations at the SLC16/SLC16N or 32 HiPath Cordless Office stations at the central board.
27. Two HG 1500 boards can be installed if PDM1 is not being used.

2.5 Technical Specifications for HiPath 3000

Table 2-8 Technical Specifications

Maximum System Values	**HiPath 3800**	**HiPath 3750**	**HiPath 3550**	**HiPath 3350**	**HiPath 3700**	**HiPath 3500**	**HiPath 3300**
Ringer Equivalence Number (type plate)	Basic cabinet = 6 A / 110 VAC, 3 A / 230 VAC Expansion cabinet = 8 A / 110 VAC, 4 A / 230 VAC	5.4/2.7 A / 115 – 230 VAC	2.6 A / 115 – 230 VAC	1.3 A / 115 – 230 VAC	5.4/2.7 A / 115 – 230 VAC	2.6 A / 115 – 230 VAC	1.3 A / 115 – 230 VAC
Line frequency	50 – 60 Hz						
Dimensions (height x width x depth in mm)	490 x 440 x 430	490 x 410 x 390	450 x 460 x 200	450 x 460 x 128	490 x 410 x 390	155 x 440 x 380	88 x 440 x 380
Height units for 19-inch cabinet assembly	11	–	–	–	11	4	2
Weight	Basic cabinet = 16.5 kg Expansion cabinet = 15.0 kg (transport weight, including backplane and cabinet feet)	22 kg (48.46 lb.) (per fully equipped cabinet)	8 kg (17.62 lb.)	6 kg (13.22 lb.)	22 kg (48.46 lb.) (per fully equipped cabinet)	8 kg (17.62 lb.)	6 kg (13.22 lb.)
					Expansion cabinet rack ECR (not for U.S. and Canada): • 6.5 kg (14.32 lb.) without batteries • 17.5 kg (38.54 lb.) with batteries		

2.6 Interface-to-Interface Ranges

Telephone interface-to-interface ranges

Table 2-9 Telephone Interface-to-Interface Ranges (with J-Y (ST) 2x2x0.6, 0.6 mm diameter)

Telephone Interfaces	Range in m	Loop Resistance in Ohms
ISDN-S_0 point-to-point	< 600	156
ISDN S_0 extended bus connection	< 400	104
ISDN S_0 bus connection[1]	< 80 for the HiPath 3800 board STMD3 (Q2217) < 120 for all other S_0 boards	21
ISDN-S_0 wall outlet to terminal	< 10	–
Analog users	< 2000	520
$U_{P0/E}$ exchange to host (master)	< 1000	230
$U_{P0/E}$ host to client (master/slave)	< 100	23

[1] Board-specific

Trunk connection and CorNet N/CorNet NQ ranges

The table below provides the maximum cable lengths for direct trunk connection and direct CorNet N/CorNet NQ wiring. The values apply to ideal conditions, which means there can be no joints, etc. The real conditions must be measured on-site.

Table 2-10 Cable Lengths for Trunk Connection and Direct CorNet N/CorNet NQ Wiring

Interface	Cable	Diameter	Attenuation per km	Max. Cable Length
S_0	ICCS cable J-2Y(ST)Y4x2x0.51 LG ICCS Data5	0.51 mm	7.5 dB at 96 kHz	800 m
	Installation cable J-2Y(ST)Y ≥ 10x2x0.6 ST III BD	0.6 mm	6.0 dB at 96 kHz	1000 m
S_{2M}	A-2Y0F(L)2Y ≥ 10x2x0.6 (full PE insulation, filled)	0.6 mm	17 dB at 1 MHz	350 m

2.7 Numbering Plan for HiPath 3000/5000

HiPath 3000/5000 provides one default numbering plan for users.

Table 2-11 Default Numbering for HiPath 3000/5000 V5.0

Type of numbering	Default station numbers				
	HiPath 3800	**HiPath 3750** **HiPath 3700**	**HiPath 3550** **HiPath 3500**	**HiPath 3350** **HiPath 3300**	**HiPath ComScendo service**
User station numbers	100 - 749	100 - 749	100 - 287 500 - 687	11 - 30 51 - 70	1000 - 1999
User direct inward dialing numbers	100 - 749	100 - 749	100 - 287 500 - 687	11 - 30 51 - 70	1000 - 1999
Trunk station number	7801 - 7920	7801 - 7920	7801 - 7920	801 - 816	7801 - 7920
Seizure codes (external codes)	0 = ROW 9 = U.S.	0 = ROW 9 = U.S.	0 = ROW 9 = U.S.	0 = ROW 9 = U.S.	0 = ROW 9 = U.S.
	80 - 84 850 - 859	80 - 84 850 - 859	80 - 84 850 - 859	82 - 88	8000 - 8062
USBS station number internal & direct inward dialing	891	891	891	891	–
IMOD station number internal & direct inward dialing	890	890	890	890	–
Digital modem internal & direct inward dialing	879	879	879	879	–
Group station numbers internal & direct inward dialing	350 - 499 8600 - 8749	350 - 499 8600 - 8749	350 - 499	31 - 50	3500 - 4499
Internal attendant code number (intercept position)	9 = ROW 0 = U.S.	9 = ROW 0 = U.S.	9 = ROW 0 = U.S.	9 = ROW 0 = U.S.	9 = ROW 0 = U.S.
Attendant code extension (intercept position)	0 = ROW – = USA	0 = ROW – = USA	0 = ROW – = USA	0 = ROW – = USA	0 = ROW – = USA
Substitution for “*”	75	75	75	75	75
Substitution for “#”	76	76	76	76	76
Service codes	*xxx #xxx	*xxx #xxx	*xxx #xxx	*xxx #xxx	–

2.8 Technical Specifications and Compliance to HiPath 3000

2.8.1 CE Compliance (Not for U.S.)

The systems conform to the following guidelines and standards:

Guideline	Standard
R&TTE Directive 99/5/EEC	● EN 60950-1: 2001 (Safety) ● EN61000-6-2 (EMC Immunity Industrial) ● EN55024 (EMC Immunity Residential) ● ETS 300 329 (DECT Emission/Immunity) ● TBR 06, ETS 301489-1/6 (DECT Air Interface)

2.8.2 Compliance with US and Canadian Standards (For U.S. and Canada Only)

Table 2-12 Compliance with US and Canadian Standards (For U.S. and Canada Only)

Category	HiPath 3800	HiPath 3750	HiPath 3550	HiPath 3350
Product security	UL 60950-1 First Edition CAN/CSA C22.2 No. 60950-1-03	UL 60950-1 First Edition CAN/CSA C22.2 No. 60950-1-03	UL 60950-1 First Edition CAN/CSA C22.2 No. 60950-1-03	
FCC Part 15 subpart J	Class A	Class A	Class A	Class B
FCC Part 68 registration	Information not available.	AY3USA-33046-MF-E AY3USA-33047-KF-E	AY3USA–25214–MF–E AY3USA–25215–KF–E	
Industry Canada CS–03 certification	Information not available.	267 9147A	267 8782A	
Ringer Equivalence Number (REN)	Information not available.	1.2	0.4	

2.8.2.1 FCC Compliance

2.8.2.1.1 FCC Rules, Part 15

Each Siemens system discussed in this section, except the HiPath 3350, has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If installation and operation are not in line with the instructions in the manual, this can lead to disruptions in radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

The HiPath 3350 has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If installation and handling are incorrect, this can lead to disruptions in radio communication However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

2.8.2.1.2 FCC Rules, Part 68

Each Siemens system discussed in this section complies with FCC Rules, Part 68. A label on the outside back of the cabinet identifies the FCC registration number, the ringer equivalence number (REN), and other information. If requested, this information must be given to the telephone company.

Disruption of the Network and T1

For networked systems using 1.544 Megabits per second (Mbps) T1 service, notify the telecommunication company when the equipment is disconnected from the network. If any Siemens system discussed in this section disrupts the telephone network, the telecommunication company can discontinue your service temporarily. If possible, the telecommunication company will notify you in advance. If this is not possible, you will receive notification at the earliest possible opportunity. In this context you will also be informed that you can lodge a complaint with the FCC.

Telephone Company Facility Changes

The telecommunication company is entitled to adapt its own equipment, devices, operating procedures and processes as necessary; such modifications may impair the operation of your equipment. If they do, you should be notified in advance so you can maintain uninterrupted telephone service.

Nonlive Voice Equipment

Nonlive voice equipment such as music-on-hold devices and recorded announcements for systems must be approved by Siemens and registered in accordance with the rules and regulations of Subpart C of the FCC Rules, Part 68; or it must be connected through protective circuitry that is approved by Siemens and registered in accordance with the rules and regulations in Subpart C of the FCC Rules, Part 68.

REN

The Ringer Equivalence Number (REN) is used to determine the number of devices that can be connected to a telephone line so that all the devices ring when that telephone number is called. In most areas, but not all, the sum of the RENs of all devices connected to a line should not exceed five. Contact the local telecommunication company to determine the maximum REN for your calling area.

Newly Established Network Area and Exchange Codes

The off-net routing feature, also known as the least-cost routing (LCR) software feature, which allows user access to the public switched network, must be configured to recognize newly established network area codes and exchange codes as soon as they are placed in service.

Failure to reconfigure the customer premises equipment to recognize the new codes as they are established restricts the customer and the customer’s employees from gaining access to the network and to these codes.

Hearing Aid Compatibility

Telephones for emergency use and telephones installed in common areas such as lobbies, hospital rooms, elevators, and hotel rooms must have handsets that are compatible with magnetically coupled hearing aids. Persons who are not in common areas also must be provided with hearing-aid compatible handsets, if needed.

For the hearing impaired, all Siemens digital telephones manufactured after August 16, 1989, are hearing aid compatible and comply with FCC Rules, Part 68, Section 68.316.

Preprogrammed Dialer Features

When you program emergency numbers or make test calls to emergency numbers using Siemens products with preprogrammed dialer features, stay on the line and briefly explain to the dispatcher the reason for the call before hanging up. Perform these activities in off-peak hours, such as early morning or late evening.

Connecting Off-Premises Station Facilities

Customers who intend to connect off-premises station (OPS) facilities must inform the telecommunication company of the OPS class for which the equipment is registered and the connection desired.

Direct Inward Dialing Answer Supervision

Customers operating any Siemens system discussed in this section without providing proper answer supervision are in violation of Part 68 of the FCC rules.

- Each Siemens system discussed in this section returns proper answer supervision to the public switched telephone network (PSTN) when DID calls are:
  - Answered by the called station.
  - Answered by the attendant.
  - Routed to a recorded announcement that can be administered by the customer.
- Each Siemens system discussed in this section returns proper answer supervision on all DID calls forwarded to the PSTN. Permissible exceptions are when:
  - A call is unanswered
  - A busy tone is received
  - A reorder tone is received

Equal Access Requirements

Call aggregators, such as hotels, hospitals, airports, colleges and universities, and so on, must provide the end user with equal access to the carriers of the user’s choice. The current equal access codes (also known as carrier access codes [CACs]) are 10xxx and 101xxxx, and 800/888 and 950, where xxx or xxxx represents the carrier identification code.

To select the carrier of choice for a call, the user dials the equal access code before dialing the called party number. Equal access is also obtained by dialing the 800/888 or 950 number of the carrier of choice.

Each Siemens system discussed in this section is capable of providing user access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities are a violation of the Telephone Operator Consumer Services Improvement Act of 1990 and Part 68 of the FCC Rules.

Electrical Safety Advisory

While each Siemens system discussed in this section is fully compliant with FCC Rules and Regulations, it is recommended that an alternating current (AC) surge protector of the form and capability suitable for the model of the system purchased be installed in the AC outlet to which the system is connected. Consult your sales partner to determine the surge protector requirements for your system.

2.8.2.2 Industry Canada Compliance

The following paragraphs describe requirements for and present information based on the Industry Canada standards.

2.8.2.2.1 REN

The Ringer Equivalence Number (REN) defines how many devices can be connected to a telephone line at the same time. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices does not exceed five.

2.8.2.2.2 Equipment Attachment Limitations

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements as described in the appropriate Terminal Equipment Technical Requirement documents. However, the Department offers no assurances that the devices will operate to the customer’s complete satisfaction at all times.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with these conditions may not prevent degradation of performance in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

DANGER
Users should not attempt to make such connections themselves, but should contact the electric inspection authority, or electrician, as appropriate.

2.8.3 SAFETY International

IEC 60950-1, first edition 2001, modified

2.9 Environmental Conditions

2.9.1 Electrical Operating Conditions

- Operating limits
  Room temperature: + 5 ...+ 40 °C (41 ... 104 °F)
  absolute humidity: 2 - 25 g H_2O/m^3
  Relative humidity: 5 - 80%
- System ventilation is by convection only. Automatic ventilation is required when using the HG 1500 in HiPath 3550 and HiPath 3350.

> ⚠ **Caution**
> Avoid exposing the system to direct sunlight and heaters (excessive heat may damage the system).
> Systems covered with condensation must be dried before being used. Do not start up the system until it has thoroughly dried.

2.9.2 Mechanical Operating Conditions

The systems are intended for stationary use.

3 Boards for HiPath 3000

Caution
The system must be powered down and de-energized before removing or inserting **all boards** in the HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300 and before removing or inserting the **central boards** of the HiPath 3800, HiPath 3750 and HiPath 3700.

DANGER (for U.S. only)
To protect against surge voltage caused by lightning, the following boards require secondary protection when their lines leave the building where the main distribution frame is housed:

- CBCC / CBRC
- DIU2U**
- SLA16N / SLA24N
- SLMA / SLMA8
- TIEL*
- TMC16
- TMDID / TMDID8
- TMEW2
- TMGL4 / TMGL4R / TMGL8
- TMST1**
- TM2LP
- TST1**
- 8SLA

* If not connected to facility provider terminal equipment.
** When this module is connected to the public network, secondary protection must be provided by the CSU.

3.1 Overview

Functional overview of all boards used

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
Central boards		
CBCC	S30810-Q2935-A301	HiPath 3550/HiPath 3350
CBCPR	S30810-Q2936-X	HiPath 3750/HiPath 3700
CBRC	S30810-Q2935-Z301	HiPath 3500/HiPath 3300

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
CBSAP	S30810-Q2314-X	HiPath 3800
CMA	S30807-Q6931-X	HiPath 3550/HiPath 3350/HiPath 3500/ HiPath 3300
CMS	S30807-Q6928-X	HiPath 3000
CR8N	S30810-Q2513-X100	HiPath 3750/HiPath 3700
CUC	S30777-Q750-X	HiPath 3550
CUCR	S30777-Q750-Z	HiPath 3500
CUP	S30777-Q751-X	HiPath 3350
CUPR	S30777-Q751-Z	HiPath 3300
DBSAP	S30807-Q6722-X	HiPath 3800
IMODN	S30807-Q6932-X100	HiPath 3000
LIM	S30807-Q6930-X	HiPath 3000
LIMS	S30807-Q6721-X	HiPath 3800
LUNA2	S30122-K7686-L1 S30122-K7686-M1	HiPath 3800
MMC	S30122-X8002-X10	HiPath 3000
PSUP	S30122-K5658-M	HiPath 3350
UPSC-D	S30122-K5660-M300	HiPath 3550/HiPath 3350
UPSC-DR	S30122-K7373-M900	HiPath 3500/HiPath 3300
UPSM	S30122-K5950-A100 S30122-K5950-S100 S30122-K5959-S121 (for RSA only)	HiPath 3750/HiPath 3700

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
Peripheral boards **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
DIU2U	S30810-Q2216-X	HiPath 3800 (for U.S. only)
DIUN2	S30810-Q2196-X	HiPath 3800
HXGM3	S30810-Q2942-X	HiPath 3750/HiPath 3700
HXGR3	S30810-K2943-Z	HiPath 3500/HiPath 3300
HXGS3	S30810-Q2943-X	HiPath 3550/HiPath 3350
IVML8	S30122-X7380-X100	HiPath 3750/HiPath 3700
IVML24	S30122-X7380-X	HiPath 3750/HiPath 3700
IVMN8	S30122-H7688-X100	HiPath 3800
IVMNL	S30122-H7688-X	HiPath 3800
IVMP8	S30122-Q7379-X100	HiPath 3350 (not for U.S.)
IVMP8R	S30122-K7379-Z100	HiPath 3300 (not for U.S.)
IVMS8	S30122-Q7379-X	HiPath 3550/HiPath 3350
IVMS8R	S30122-K7379-Z	HiPath 3500/HiPath 3300
PBXXX	S30810-Q6401-X	HiPath 3800
SLA8N	S30810-Q2929-X200	HiPath 3750/HiPath 3550/HiPath 3700 (not for U.S.)
SLA16N	S30810-Q2929-X100	HiPath 3750/HiPath 3550/HiPath 3700
SLA24N	S30810-Q2929-X	HiPath 3750/HiPath 3550/HiPath 3700
SLC16	S30810-Q2922-X	HiPath 3750/HiPath 3550/HiPath 3700 (not for U.S.)
SLC16N	S30810-Q2193-X100	HiPath 3750/HiPath 3550/HiPath 3700 (not for U.S.)
SLCN	S30810-Q2193-X300	HiPath 3800 (not for U.S.)
SLMA	S30810-Q2191-C300	HiPath 3800
SLMA8	S30810-Q2191-C100	HiPath 3800
SLMO2	S30810-Q2168-X10	HiPath 3800
SLMO8	S30810-Q2168-X100	HiPath 3800
SLMO8	S30810-Q2901-X100	HiPath 3750/HiPath 3700 (not for U.S.)
SLMO24	S30810-Q2901-X	HiPath 3750/HiPath 3550/HiPath 3700

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
SLU8	S30817-Q922-A301	HiPath 3550/HiPath 3350
SLU8R	S30817-K922-Z301	HiPath 3550/HiPath 3300
STLS2	S30817-Q924-B313	HiPath 3550/HiPath 3350 (not for U.S.)
STLS4	S30817-Q924-A313	HiPath 3550/HiPath 3350
STLS4R	S30817-K924-Z313	HiPath 3500/HiPath 3300
STLSX2	S30810-Q2944-X100	HiPath 3550/HiPath 3350
STLSX4	S30810-Q2944-X	HiPath 3550/HiPath 3350
STLSX4R	S30810-K2944-Z	HiPath 3500/HiPath 3300
STMD3	S30810-Q2217-X10 S30810-Q2217-X110	HiPath 3800
STMD8	S30810-Q2558-X200	HiPath 3750/HiPath 3700
STMI2	S30810-Q2316-X100	HiPath 3800
TIEL	S30810-Q2520-X	HiPath 3750/HiPath 3700
TLA2	S30817-Q923-Bxxx	HiPath 3550/HiPath 3350 (not for U.S.)
TLA4	S30817-Q923-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
TLA8	S30817-Q926-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
TLA4R	S30817-Q923-Zxxx	HiPath 3550/HiPath 3300 (not for U.S.)
TM2LP	S30810-Q2159-Xxxx	HiPath 3800
TMAMF	S30810-Q2587-A200 S30810-Q2587-A400	HiPath 3750/HiPath 3700 HiPath 3550 (for selected countries only)
TMC16	S30810-Q2485-X	HiPath 3800 (for U.S. only)
TMCAS	S30810-Q2938-X	HiPath 3750/HiPath 3550/HiPath 3700 (for selected countries only)
TMDID	S30810-Q2452-X	HiPath 3800 (for U.S. only)
TMDID8	S30810-Q2507-X	HiPath 3750/HiPath 3700 (for U.S. only)
TMEW2	S30810-Q2292-X100	HiPath 3800
TMGL4	S30810-Q2918-X	HiPath 3550/HiPath 3350 (for U.S. only)
TMGL4R	S30810-K2918-Z	HiPath 3500/HiPath 3300 (for U.S. only)
TMGL8	S30810-Q2703-X	HiPath 3750/HiPath 3700 (for U.S. only)
TML8W	S30817-Q626-Axxx/Bxxx	HiPath 3750/HiPath 3700 (not for U.S.)

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
TMQ4	S30810-Q2917-X	HiPath 3550/HiPath 3350 (for U.S. only)
TMST1	S30810-Q2920-X	HiPath 3750/HiPath 3700 (for U.S. only)
TMS2	S30810-Q2915-X	HiPath 3750/HiPath 3700 (not for U.S.)
TST1	S30810-Q2919-X S30810-K2919-Z	HiPath 3550 (for U.S. only) HiPath 3500 (for U.S. only)
TS2	S30810-Q2913-X300	HiPath 3550
TS2R	S30810-K2913-Z300	HiPath 3500
4SLA	S30810-Q2923-X200	HiPath 3550/HiPath 3350 (not for U.S.)
8SLA	S30810-Q2923-X100	HiPath 3550/HiPath 3350
8SLAR	S30810-K2925-Z	HiPath 3500/HiPath 3300
16SLA	S30810-Q2923-X	HiPath 3550/HiPath 3350 (not for U.S.)

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
Options		
ALUM4	S30817-Q935-A	HiPath 3550/HiPath 3350
ANI4	S30807-Q6917-Axxx	HiPath 3550/HiPath 3350 (for selected countries only)
ANI4R	S30807-Q6917-Z103	HiPath 3500/HiPath 3300 (for selected countries only)
EVM	S30807-Q6945-X	HiPath 3550/HiPath 3350/HiPath 3500/ HiPath 3300
EXM	S30817-Q902-B401	HiPath 3550/HiPath 3350
EXMR	S30122-K7403-Z	HiPath 3500/HiPath 3300
EXMNA	S30817-Q6923-X	HiPath 3550/HiPath 3350 (for U.S. only)
GEE8	S30817-Q664-xxxx	HiPath 3750/HiPath 3700 (not for U.S.)
GEE12	S30817-Q951-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
GEE16	S30817-Q951-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
GEE50	S30817-Q951-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
HOPE	S30122-Q7078-X S30122-Q7079-X	HiPath 3550/HiPath 3350 (for U.S. only)
MPPI	S30122-K5380-X200	HiPath 3550/HiPath 3350 (not for U.S.)
MPPI	S30122-K7275-B	HiPath 3000
OPAL	C39195-A7001-B130	HiPath 3550/HiPath 3350
OPALR	C39195-A7001-B142	HiPath 3500/HiPath 3300
PDM1 PDM1	S30807-Q5692-X100	HiPath 3750/HiPath 3700 HiPath 3550/HiPath 3350/HiPath 3500/ HiPath 3300
PDMX	S30807-Q5697-X200	HiPath 3800
PFT1/PFT4	S30777-Q539-X S30777-Q540-X	HiPath 3800/HiPath 3750 (not for U.S.)
REAL	S30807-Q5913-X	HiPath 3750/HiPath 3700
REALS	S30807-Q6629-X	HiPath 3800
STBG4	S30817-Q934-A	HiPath 3550/HiPath 3350 (France only)
STRB	S30817-Q932-A	HiPath 3550/HiPath 3350
STRBR	S30817-Q932-Z	HiPath 3500/HiPath 3300

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
UAM	S30122-X7217-X	HiPath 3550/HiPath 3350 (not for U.S.)
UAMR	S30122-X7402-Z	HiPath 3500/HiPath 3300 (not for U.S.)
V24/1	S30807-Q6916-X100	HiPath 3550/HiPath 3350 (not for U.S.)

Overview of all board models used

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3800		
AMOM	S30807-K5480-Xxxx	Opto-electronic converter
CBSAP	S30810-Q2314-X	Central board
CMS	S30807-Q6928-X	Central board
DBSAP	S30807-Q6722-X	Central board
DIU2U	S30810-Q2216-X	Peripheral board (for U.S. only)
DIUN2	S30810-Q2196-X	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMN8	S30122-H7688-X100	Peripheral board
IVMNL	S30122-H7688-X	Peripheral board
LIMS	S30807-Q6721-X	Central board
LUNA2	S30122-K7686-L1 S30122-K7686-M1	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K7275-B	Option
PBXXX	S30810-Q6401-X	Peripheral board
PDMX	S30807-Q5697-X200	Option
PFT1/PFT4	S30777-Q539-X S30777-Q540-X	Option (not for U.S.)
REALS	S30807-Q6629-X	Option
SLCN	S30810-Q2193-X300	Peripheral board (not for U.S.)
SLMA	S30810-Q2191-C300	Peripheral board
SLMA8	S30810-Q2191-C100	Peripheral board
SLMO2	S30810-Q2168-X10	Peripheral board
SLMO8	S30810-Q2168-X100	Peripheral board
STMD3	S30810-Q2217-X10 S30810-Q2217-X110	Peripheral board
STMI2	S30810-Q2316-X100	Peripheral board
TM2LP	S30810-Q2159-Xxxx	Peripheral board
TMC16	S30810-Q2485-X	Peripheral board (for U.S. only)
TMDID	S30810-Q2452-X	Peripheral board (for U.S. only)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
TMEW2	S30810-Q2292-X100	Peripheral board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3750, HiPath 3700		
CBCPR	S30810-Q2936-X	Central board
CMS	S30807-Q6928-X	Central board
CR8N	S30810-Q2513-X100	Central board
GEE8	S30817-Q664-xxxx	Option (not for U.S.)
HXGM3	S30810-Q2942-X	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVML8	S30122-X7380-X100	Peripheral board
IVML24	S30122-X7380-X	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K7275-B	Option
PDM1	S30807-Q5692-X100	Option
PFT1/PFT4	S30777-Q539-X S30777-Q540-X	Option (not for U.S.)
REAL	S30807-Q5913-X	Option
SLA8N	S30810-Q2929-X200	Peripheral board (not for U.S.)
SLA16N	S30810-Q2929-X100	Peripheral board
SLA24N	S30810-Q2929-X	Peripheral board
SLC16	S30810-Q2922-X	Peripheral board (not for U.S.)
SLC16N	S30810-Q2193-X100	Peripheral board (not for U.S.)
SLMO8	S30810-Q2901-X100	Peripheral board (not for U.S.)
SLMO24	S30810-Q2901-X	Peripheral board
STMD8	S30810-Q2558-X200	Peripheral board
TIEL	S30810-Q2520-X	Peripheral board
TMAMF	S30810-Q2587-A200	Peripheral board (for selected countries only)
TMCAS	S30810-Q2938-X	Peripheral board (for selected countries only)
TMDID8	S30810-Q2507-X	Peripheral board (for U.S. only)
TMGL8	S30810-Q2703-X	Peripheral board (for U.S. only)
TML8W	S30817-Q626-Axxx/Bxxx	Peripheral board (not for U.S.)
TMST1	S30810-Q2920-X	Peripheral board (for U.S. only)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
TMS2	S30810-Q2915-X	Peripheral board (not for U.S.)
UPSM	S30122-K5950-A100 S30122-K5950-S100 S30122-K5959-S121 (for RSA only)	Central board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3550 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
ALUM4	S30817-Q935-A	Option
ANI4	S30807-Q6917-Axxx	Option (for selected countries only)
CBCC	S30810-Q2935-A301	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUC	S30777-Q750-X	Central board
EVM	S30807-Q6945-X	Option
EXM	S30817-Q902-B401	Option
EXMNA	S30817-Q6923-X	Option (for U.S. only)
GEE12	S30817-Q951-Axxx	Option (not for U.S.)
GEE16	S30817-Q951-Axxx	Option (not for U.S.)
GEE50	S30817-Q951-Axxx	Option (not for U.S.)
HOPE	S30122-Q7078-X S30122-Q7079-X	Option (for U.S. only)
HXGS3	S30810-Q2943-X	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMS8	S30122-Q7379-X	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K5380-X200 (not for U.S.) S30122-K7275-B	Option
OPAL	C39195-A7001-B130	Cable
PDM1	S30807-Q5692-X100	Option
SLA8N	S30810-Q2929-X200	Peripheral board (not for U.S.)
SLA16N	S30810-Q2929-X100	Peripheral board
SLA24N	S30810-Q2929-X	Peripheral board
SLC16	S30810-Q2922-X	Peripheral board (not for U.S.)
SLC16N	S30810-Q2193-X100	Peripheral board (not for U.S.)
SLMO24	S30810-Q2901-X	Peripheral board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
SLU8	S30817-Q922-A301	Peripheral board
STBG4	S30817-Q934-A	Option (France only)
STLS2	S30817-Q924-B313	Peripheral board (not for U.S.)
STLS4	S30817-Q924-A313	Peripheral board
STLSX2	S30810-Q2944-X100	Peripheral board
STLSX4	S30810-Q2944-X	Peripheral board
STRB	S30817-Q932-A	Option
TLA2	S30817-Q923-Bxxx	Peripheral board (not for U.S.)
TLA4	S30817-Q923-Axxx	Peripheral board (not for U.S.)
TLA8	S30817-Q926-Axxx	Peripheral board (not for U.S.)
TMAMF	S30810-Q2587-A400	Peripheral board (for selected countries only)
TMCAS	S30810-Q2938-X	Peripheral board (for selected countries only)
TMGL4	S30810-Q2918-X	Peripheral board (for U.S. only)
TMQ4	S30810-Q2917-X	Peripheral board (for U.S. only)
TST1	S30810-Q2919-X	Peripheral board (for U.S. only)
TS2	S30810-Q2913-X300	Peripheral board (not for U.S.)
UAM	S30122-X7217-X	Option (not for U.S.)
UPSC-D	S30122-K5660-M300	Central board
V24/1	S30807-Q6916-X100	Option (not for U.S.)
4SLA	S30810-Q2923-X200	Peripheral board (not for U.S.)
8SLA	S30810-Q2923-X100	Peripheral board
16SLA	S30810-Q2923-X	Peripheral board (not for U.S.)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3350 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
ALUM4	S30817-Q935-A	Option
ANI4	S30807-Q6917-Axxx	Option (for selected countries only)
CBCC	S30810-Q2935-A301	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUP	S30777-Q751-X	Central board
EVM	S30807-Q6945-X	Option
EXM	S30817-Q902-B401	Option
EXMNA	S30817-Q6923-X	Option (for U.S. only)
GEE12	S30817-Q951-Axxx	Option (not for U.S.)
GEE16	S30817-Q951-Axxx	Option (not for U.S.)
GEE50	S30817-Q951-Axxx	Option (not for U.S.)
HOPE	S30122-Q7078-X S30122-Q7079-X	Option (for U.S. only)
HXGS3	S30810-Q2943-X	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMP8	S30122-Q7379-X100	Peripheral board (not for U.S.)
IVMS8	S30122-Q7379-X	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K5380-X200 (not for U.S.) S30122-K7275-B	Option
OPAL	C39195-A7001-B130	Cable
PDM1	S30807-Q5692-X100	Option
PSUP	S30122-K5658-M	Central board
SLU8	S30817-Q922-A301	Peripheral board
STBG4	S30817-Q934-A	Option (France only)
STLS2	S30817-Q924-B313	Peripheral board (not for U.S.)
STLS4	S30817-Q924-A313	Peripheral board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
STLSX2	S30810-Q2944-X100	Peripheral board
STLSX4	S30810-Q2944-X	Peripheral board
STRB	S30817-Q932-A	Option
TLA2	S30817-Q923-Bxxx	Peripheral board (not for U.S.)
TLA4	S30817-Q923-Axxx	Peripheral board (not for U.S.)
TLA8	S30817-Q926-Axxx	Peripheral board (not for U.S.)
TMGL4	S30810-Q2918-X	Peripheral board (for U.S. only)
TMQ4	S30810-Q2917-X	Peripheral board (for U.S. only)
UAM	S30122-X7217-X	Option (not for U.S.)
UPSC-D	S30122-K5660-M300	Central board
V24/1	S30807-Q6916-X100	Option (not for U.S.)
4SLA	S30810-Q2923-X200	Peripheral board (not for U.S.)
8SLA	S30810-Q2923-X100	Peripheral board
16SLA	S30810-Q2923-X	Peripheral board (not for U.S.)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3500 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
ANI4R	S30807-Q6917-Z103	Option (for selected countries only)
CBRC	S30810-Q2935-Z301	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUCR	S30777-Q750-Z	Central board
EVM	S30807-Q6945-X	Option
EXMR	S30122-K7403-Z	Option
HXGR3	S30810-K2943-Z	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMS8R	S30122-K7379-Z	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K7275-B	Option
OPALR	C39195-A7001-B142	Cable
PDM1	S30807-Q5692-X100	Option
SLU8R	S30817-K922-Z301	Peripheral board
STLS4R	S30817-K924-Z313	Peripheral board
STLSX4R	S30810-K2944-Z	Peripheral board
STRBR	S30817-Q932-Z	Option
TLA4R	S30817-Q923-Zxxx	Peripheral board (not for U.S.)
TMGL4R	S30810-K2918-Z	Peripheral board (for U.S. only)
TST1	S30810-K2919-Z	Peripheral board (for U.S. only)
TS2R	S30810-K2913-Z300	Peripheral board (not for U.S.)
UAMR	S30122-X7402-Z	Option (not for U.S.)
UPSC-DR	S30122-K7373-M900	Central board
8SLAR	S30810-K2925-Z	Peripheral board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3300 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
ANI4R	S30807-Q6917-Z103	Option (for selected countries only)
CBRC	S30810-Q2935-Z301	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUPR	S30777-Q751-Z	Central board
EVM	S30807-Q6945-X	Option
EXMR	S30122-K7403-Z	Option
HXGR3	S30810-K2943-Z	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMP8R	S30122-K7379-Z100	Peripheral board (not for U.S.)
IVMS8R	S30122-K7379-Z	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K7275-B	Option
OPALR	C39195-A7001-B142	Cable
PDM1	S30807-Q5692-X100	Option
SLU8R	S30817-K922-Z301	Peripheral board
STLS4R	S30817-K924-Z313	Peripheral board
STLSX4R	S30810-K2944-Z	Peripheral board
STRBR	S30817-Q932-Z	Option
TLA4R	S30817-Q923-Zxxx	Peripheral board (not for U.S.)
TMGL4R	S30810-K2918-Z	Peripheral board (for U.S. only)
UAMR	S30122-X7402-Z	Option (not for U.S.)
UPSC-DR	S30122-K7373-M900	Central board
8SLAR	S30810-K2925-Z	Peripheral board

3.2 Central Boards

Caution
The system must be powered down and de-energized before removing or inserting **all boards** in the HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300 and before removing or inserting the **central boards** of the HiPath 3800, HiPath 3750 and HiPath 3700.

3.2.1 CBCC

Introduction

The CBCC board (**C**entral **B**oard with **C**oldfire **C**om, S30810-Q2935-A301) performs all central control and switching functions for HiPath 3550 and HiPath 3350 (see Figure 3-1).

The CBCC central control board must be upgraded for HiPath 3000 V5.0. The “old” CBCC board S30810-Q2935-A201 is not supported.
For Deutsche Telekom AG only: The CBCP board S30810-Q2935-B201 is not supported by HiPath 3000 V5.0 and must be replaced by a CBCC board S30810-Q2935-A301.

Subboards

The following subboards can be used depending on the application:

- Clock module CMA or CMS (optional)
- MMC multimedia card
- IMODN integrated modem card new (optional)
- LIM LAN interface module (optional)
- MPPI music on hold (optional)
- EVM entry voice mail (optional)

Outputs, interfaces

- Eight digital $U_{P0/E}$ subscriber lines
  For example, $U_{P0/E}$ workpoint clients or BS3/1 base stations for HiPath Cordless Office can be connected here.
- Four analog T/R subscriber lines
  For U.S. only: These interfaces do not support the connection of external extensions via OPS (Off-Premises Station) signaling.

For Australia only: The T/R interfaces supply a ring voltage of 35 V_{eff}. Depending on the terminals connected, we cannot exclude the possibility of errors occurring during ringing state.

- Two digital S_0 interfaces (CO (default) or station)
- Backplane (CUC or CUP) connection via slots 1 (X11), 2 (X5) and 3 (X6)
- Music on hold: MPPI, EXM

> Please note that only one MPPI module may be connected. In other words, you can connect either MPPI S30122-K5380-X200 via X4 or MPPI S30122-K7275-B via X19/X20.

- Options bus (O bus)
- Two V.24 interfaces. The second interface is implemented via the V24/1 option.

Switches and indicators

- Reset/reload switch
  - Switch pressed < 5 s = Reset activated
  - Switch pressed > 5 s = Reload activated (RUN LED out indicates that a reload is in progress)
- RUN LED
  LED status meaning is explained in the following table.

Table 3-3 CBCC - LED Status Meaning

RUN LED	Meaning
Off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

[1] The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

Figure

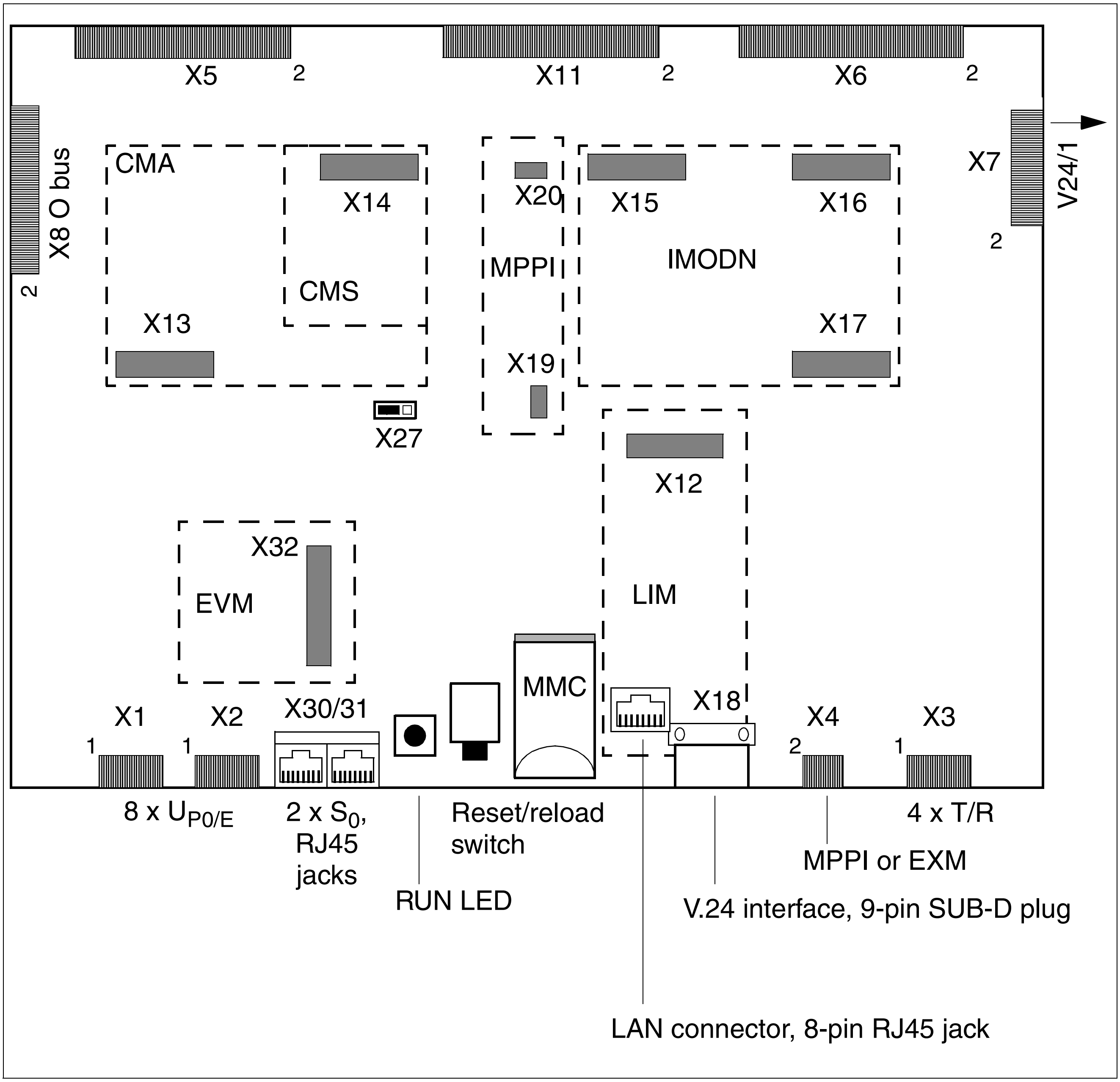

X5
2
X11
2
X6
2
X8 O bus
2
CMA
X14
CMS
X13
X20
MPPI
X19
X15
X16
IMODN
X17
X7
2
V24/1
X27
X12
LIM
X32
EVM
MMC
X18
X1
1
X2
1
X30/31
X4
2
X3
1
8 x $U_{P0/E}$
2 x S_0, RJ45 jacks
RUN LED
Reset/reload switch
4 x T/R
MPPI or EXM
V.24 interface, 9-pin SUB-D plug
LAN connector, 8-pin RJ45 jack

Figure 3-1 CBCC Board (S30810-Q2935-A301)

Disconnecting the battery buffer by unplugging the X27 jumper is necessary only for testing (module test at the factory). Disconnection does not necessarily delete the customer database (CDB). To delete the CDB, use the reset switch.

X1 to X4 contact assignments

Table 3-4 CBCC - X1 to X4 Contact Assignments

Contact	Connector X1	Connector X2	Connector X3	Connector X4
	$U_{P0/E}$		T/R	MPPI or EXM
1	$U_{P0/E}$ port 1b	$U_{P0/E}$ port 5b	T/R port 1a	GND
2	$U_{P0/E}$ port 1a	$U_{P0/E}$ port 5a	T/R port 1b	Not used
3	$U_{P0/E}$ port 2b	$U_{P0/E}$ port 6b	T/R port 2a	Not used
4	$U_{P0/E}$ port 2a	$U_{P0/E}$ port 6a	T/R port 2b	EXMCLK (512 kHz data cycle)
5	$U_{P0/E}$ port 3b	$U_{P0/E}$ port 7b	T/R port 3a	EXMDIR (8 kHz frame cycle)
6	$U_{P0/E}$ port 3a	$U_{P0/E}$ port 7a	T/R port 3b	EXMRES (high-active reset)
7	$U_{P0/E}$ port 4b	$U_{P0/E}$ port 8b	T/R port 4a	EXMD (data line)
8	$U_{P0/E}$ port 4a	$U_{P0/E}$ port 8a	T/R port 4b	EXMDET (detect signal)
9	–	–	–	+5 V
10	–	–	–	Not used

S_0 interface assignment

Table 3-5 CBCC - S_0 Interface Assignment (RJ45 Jacks)

Contact	S_0	
	X30	X31
1	–	–
2	–	–
3	S_0 port 1, transmit +	S_0 port 2, transmit +
4	S_0 port 1, receive +	S_0 port 2, receive +
5	S_0 port 1, receive –	S_0 port 2, receive –
6	S_0 port 1, transmit –	S_0 port 2, transmit –
7	–	–
8	–	–

V.24 interface assignment

Table 3-6 CBCC - V.24 Interface Assignment (SUB-D Plug)

X18, pin	Signal	Description
1	–	Not used
2	RxD A	Receive data, channel A
3	TxD A	Transmit data, channel A
4	–	Not used
5	0 V	Ground
6	–	Not used
7	RTS A	Request to send, channel A
8	CTS A	Clear to send, channel A
9	–	Not used

LAN connector assignment

Table 3-7 CBCC - LAN Connector Assignment (RJ45 Jack) via LIM

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

Default numbering plan when using CBCC in HiPath 3550

Table 3-8 Default Numbering Plan When Using CBCC in HiPath 3550

Station	Int. call no.	DID no.	Port
$U_{P0/E}$ host (master)	100	100	$U_{P0/E}$ 1
	101	101	$U_{P0/E}$ 2
	102	102	$U_{P0/E}$ 3
	103	103	$U_{P0/E}$ 4
	104	104	$U_{P0/E}$ 5
	105	105	$U_{P0/E}$ 6
	106	106	$U_{P0/E}$ 7
	107	107	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	500	500	$U_{P0/E}$ 1
	501	501	$U_{P0/E}$ 2
	502	502	$U_{P0/E}$ 3
	503	503	$U_{P0/E}$ 4
	504	504	$U_{P0/E}$ 5
	505	505	$U_{P0/E}$ 6
	506	506	$U_{P0/E}$ 7
	507	507	$U_{P0/E}$ 8
T/R	108	108	T/R 1
	109	109	T/R 2
	110	110	T/R 3
	111	111	T/R 3
EVM	112	112	EVM-1
	113	113	EVM-2
Line	**Code**		**Port**
S_0 CO PP	7801		S_0 1-1
	7802		S_0 1-2
	7803		S_0 2-1
	7804		S_0 2-2

Default numbering plan when using CBCC in HiPath 3350

Table 3-9 Default Numbering Plan When Using CBCC in HiPath 3350

Station	Int. call no.	DID no.	Port
$U_{P0/E}$ host (master)	11	11	$U_{P0/E}$ 1
	12	12	$U_{P0/E}$ 2
	13	13	$U_{P0/E}$ 3
	14	14	$U_{P0/E}$ 4
	15	15	$U_{P0/E}$ 5
	16	16	$U_{P0/E}$ 6
	17	17	$U_{P0/E}$ 7
	18	18	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	51	51	$U_{P0/E}$ 1
	52	52	$U_{P0/E}$ 2
	53	53	$U_{P0/E}$ 3
	54	54	$U_{P0/E}$ 4
	55	55	$U_{P0/E}$ 5
	56	56	$U_{P0/E}$ 6
	57	57	$U_{P0/E}$ 7
	58	58	$U_{P0/E}$ 8
T/R	19	19	T/R 1
	20	20	T/R 2
	21	21	T/R 3
	22	22	T/R 3
EVM	23	23	EVM-1
	24	24	EVM-2
Line	**Code**		**Port**
S_0 CO PP	801		S_0 1-1
	802		S_0 1-2
	803		S_0 2-1
	804		S_0 2-2

3.2.2 CBRC

Introduction

The CBRC board (**C**entral **B**oard **R**ack **C**om, S30810-Q2935-Z301) performs all central control and switching functions for HiPath 3500 and HiPath 3300 (see Figure 3-2).

> The CBRC central control board must be upgraded for HiPath 3000 V5.0. The “old” CBRC board S30810-K2935-Z is not supported.

Subboards

The following subboards can be used depending on the application:

- Clock module CMA or CMS (optional)
- MMC multimedia card
- IMODN integrated modem card new (optional)
- LIM LAN interface module (optional)
- MPPI music on hold (optional)
- EVM entry voice mail (optional)

Outputs, interfaces

- Eight digital $U_{P0/E}$ subscriber lines
  For example, $U_{P0/E}$ workpoint clients or BS3/1 base stations for HiPath Cordless Office can be connected here.
- Four analog T/R subscriber lines
  For U.S. only: These interfaces do not support the connection of external extensions via OPS (Off-Premises Station) signaling.
  For Australia only: The T/R interfaces supply a ring voltage of 35 V_{eff}. Depending on the terminals connected, we cannot exclude the possibility of errors occurring during ringing state.
- Two digital S_0 interfaces (CO (default) or station)
- Backplane (CUCR or CUPR) connection via slots 1 (X11), 2 (X5) and 3 (X6)
- Music on hold: MPPI, EXMR
- Options bus (O bus)
- V.24 interface

Switches and indicators

- Reset/reload switch
  - Switch pressed < 5 s = Reset activated
  - Switch pressed > 5 s = Reload activated (RUN LED out indicates that a reload is in progress)
- RUN LED
  LED status meaning is explained in the following table.

Table 3-10 CBRC - LED Status Meaning

RUN LED	Meaning
Off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

[1] The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

Figure

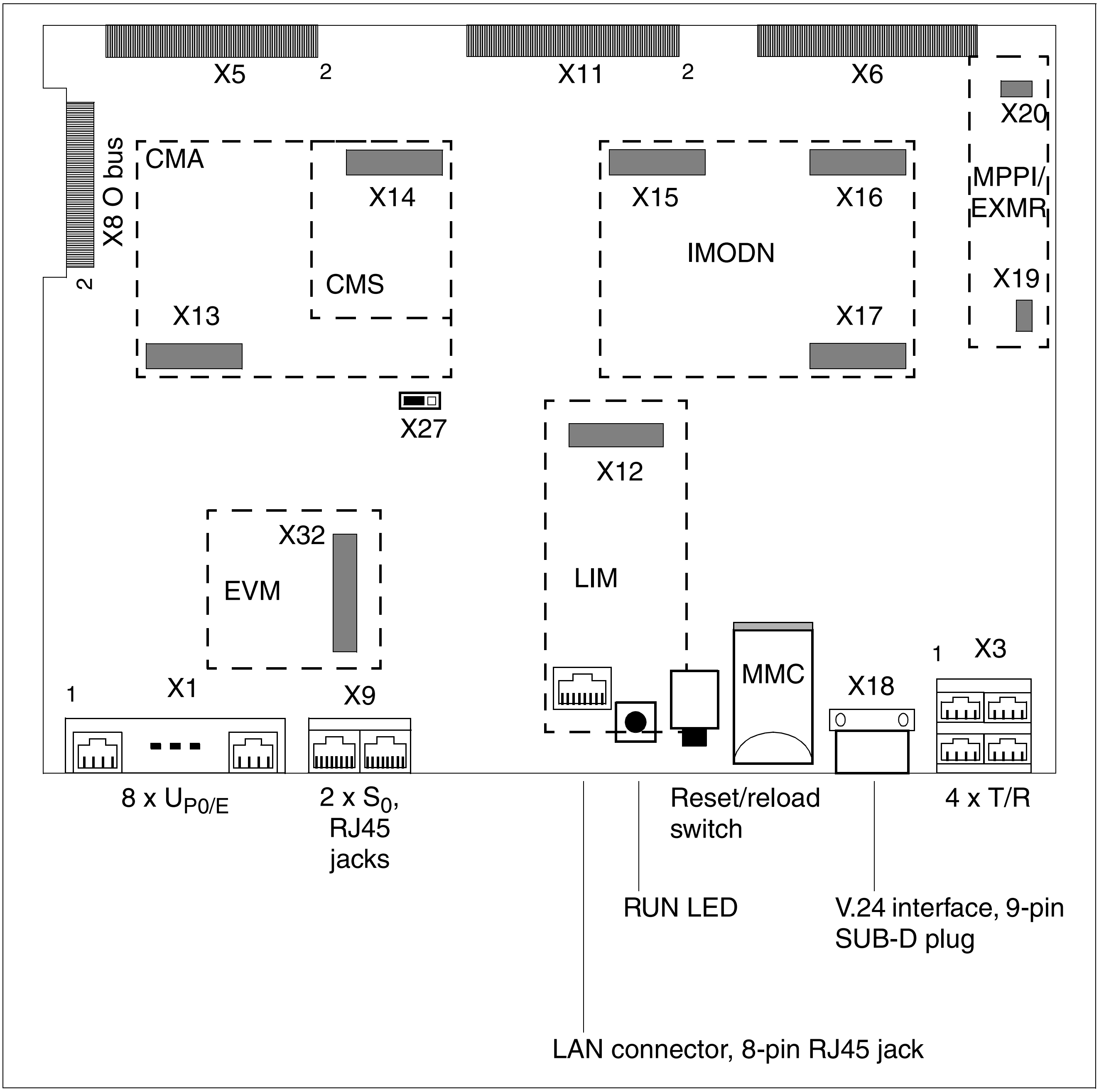

X5
2
X11
2
X6
X20
X8 O bus
2
CMA
X14
CMS
X13
X15
X16
IMODN
X17
MPPI/
EXMR
X19
X27
X12
LIM
X32
EVM
MMC
X18
1
X3
1
X1
X9
8 x $U_{P0/E}$
2 x S_0, RJ45 jacks
Reset/reload switch
4 x T/R
RUN LED
V.24 interface, 9-pin SUB-D plug
LAN connector, 8-pin RJ45 jack

Figure 3-2 CBRC Board (S30810-Q2935-Z301)

Disconnecting the battery buffer by unplugging the X27 jumper is necessary only for testing (module test at the factory). Disconnection does not necessarily delete the customer database (CDB). To delete the CDB, use the reset switch.

X1 and X3 contact assignments

Table 3-11 CBRC - X1 and X3 Contact Assignments

Contact	Connector X1	Connector X3
	$U_{P0/E}$	T/R
14	$U_{P0/E}$ port 1a	T/R port 1a
15	$U_{P0/E}$ port 1b	T/R port 1b
24	$U_{P0/E}$ port 2a	T/R port 2a
25	$U_{P0/E}$ port 2b	T/R port 2b
34	$U_{P0/E}$ port 3a	T/R port 3a
35	$U_{P0/E}$ port 3b	T/R port 3b
44	$U_{P0/E}$ port 4a	T/R port 4a
45	$U_{P0/E}$ port 4b	T/R port 4b
54	$U_{P0/E}$ port 5a	–
55	$U_{P0/E}$ port 5b	–
64	$U_{P0/E}$ port 6a	–
65	$U_{P0/E}$ port 6b	–
74	$U_{P0/E}$ port 7a	–
75	$U_{P0/E}$ port 7b	–
84	$U_{P0/E}$ port 8a	–
85	$U_{P0/E}$ port 8b	–

S_0 interface assignment

Table 3-12 CBRC - S_0 Interface Assignment (RJ45 Jacks)

X9 Pin	S_0 port 1	X9 Pin	S_0 port 2
11	–	21	–
12	–	22	–
13	S_0 port 1, transmit +	23	S_0 port 2, transmit +
14	S_0 port 1, receive +	24	S_0 port 2, receive +
15	S_0 port 1, receive –	25	S_0 port 2, receive –
16	S_0 port 1, transmit –	26	S_0 port 2, transmit –
17	–	27	–
18	–	28	–

V.24 interface assignment

Table 3-13 CBRC - V.24 Interface Assignment (SUB-D Plug)

X18, pin	Signal	Description
1	–	Not used
2	RxD A	Receive data, channel A
3	TxD A	Transmit data, channel A
4	–	Not used
5	0 V	Ground
6	–	Not used
7	RTS A	Request to send, channel A
8	CTS A	Clear to send, channel A
9	–	Not used

LAN connector assignment

Table 3-14 CBRC - LAN Connector Assignment (RJ45 Jack) via LIM

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

Default numbering plan when using CBRC in HiPath 3500

Table 3-15 Default Numbering Plan When Using CBRC in HiPath 3500

Station	**Int. call no.**	**DID no.**	**Port**
$U_{P0/E}$ host (master)	100	100	$U_{P0/E}$ 1
	101	101	$U_{P0/E}$ 2
	102	102	$U_{P0/E}$ 3
	103	103	$U_{P0/E}$ 4
	104	104	$U_{P0/E}$ 5
	105	105	$U_{P0/E}$ 6
	106	106	$U_{P0/E}$ 7
	107	107	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	500	500	$U_{P0/E}$ 1
	501	501	$U_{P0/E}$ 2
	502	502	$U_{P0/E}$ 3
	503	503	$U_{P0/E}$ 4
	504	504	$U_{P0/E}$ 5
	505	505	$U_{P0/E}$ 6
	506	506	$U_{P0/E}$ 7
	507	507	$U_{P0/E}$ 8
T/R	108	108	T/R 1
	109	109	T/R 2
	110	110	T/R 3
	111	111	T/R 3
EVM	112	112	EVM-1
	113	113	EVM-2
Line	**Code**		**Port**
S_0 CO PP	7801		S_0 1-1
	7802		S_0 1-2
	7803		S_0 2-1
	7804		S_0 2-2

Default numbering plan when using CBRC in HiPath 3300

Table 3-16 Default Numbering Plan When Using CBRC in HiPath 3300

Station	**Int. call no.**	**DID no.**	**Port**
$U_{P0/E}$ host (master)	11	11	$U_{P0/E}$ 1
	12	12	$U_{P0/E}$ 2
	13	13	$U_{P0/E}$ 3
	14	14	$U_{P0/E}$ 4
	15	15	$U_{P0/E}$ 5
	16	16	$U_{P0/E}$ 6
	17	17	$U_{P0/E}$ 7
	18	18	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	51	51	$U_{P0/E}$ 1
	52	52	$U_{P0/E}$ 2
	53	53	$U_{P0/E}$ 3
	54	54	$U_{P0/E}$ 4
	55	55	$U_{P0/E}$ 5
	56	56	$U_{P0/E}$ 6
	57	57	$U_{P0/E}$ 7
	58	58	$U_{P0/E}$ 8
T/R	19	19	T/R 1
	20	20	T/R 2
	21	21	T/R 3
	22	22	T/R 3
EVM	23	23	EVM-1
	24	24	EVM-2
Line	**Code**		**Port**
S_0 CO PP	801		S_0 1-1
	802		S_0 1-2
	803		S_0 2-1
	804		S_0 2-2

3.2.3 CBCPR

Introduction

The CBCPR board (shown in Figure 3-3) performs all central control and switching functions for HiPath 3750 and HiPath 3700.

> Disconnecting the battery buffer by unplugging the X27 jumper is necessary only for testing (module test at the factory). Disconnection does not necessarily delete the customer database (CDB). To delete the CDB, use the reset switch.

Subboards

The following subboards can be used depending on the application:

- CMS clock module (optional)
- MMC multimedia card
- IMODN integrated modem card new (optional)
- LIM LAN interface module (optional)
  Section 3.2.12 contains information on how to make the LAN connection.
- MPPI music on hold (optional)

V.24 interfaces

- To connect a service PC, you can access the first V.24 interface (9-pin SUB-D plug) on the CBCPR from the front of the basic cabinet (after removing the cover). (See Figure 3-3.)
- You can access the second V.24 interface (25-pin SUB-D plug) via the backplane of the basic cabinet (X7).

Switches and indicators

- Reset/reload switch
  - Switch pressed < 5 s = Reset activated
  - Switch pressed > 5 s = Reload activated (RUN LED out indicates that a reload is in progress)
- RUN LED
  Signals the current status of the CBCPR board (see Table 12-2).

Diagram of the CBCPR board

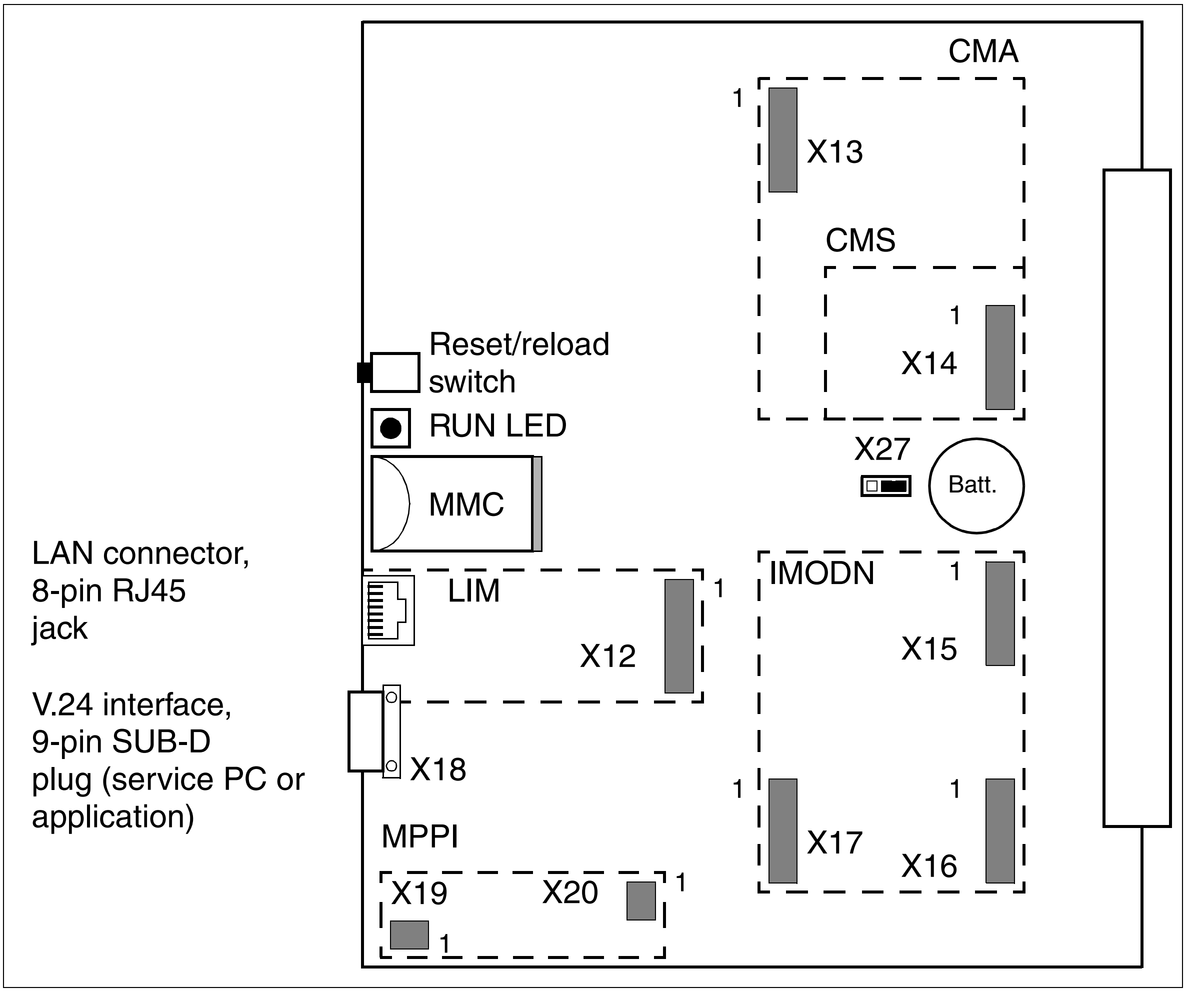

CMA
1
X13
CMS
1
X14
Reset/reload switch
RUN LED
MMC
X27
Batt.
LAN connector, 8-pin RJ45 jack
LIM
X12
1
IMODN
1
X15
V.24 interface, 9-pin SUB-D plug (service PC or application)
X18
1
X17
1
X16
MPPI
X19
X20
1
1

Figure 3-3 CBCPR Board (S30810-Q2936-X)

V.24 interface assignment

Table 3-17 CBCPR - V.24 Interface Assignment (SUB-D Plug)

X18, pin	Signal	Description
1	–	Not used
2	RxD A	Receive data, channel A
3	TxD A	Transmit data, channel A
4	–	Not used
5	0 V	Ground
6	–	Not used
7	RTS A	Request to send, channel A
8	CTS A	Clear to send, channel A
9	–	Not used

LAN connector assignment

Table 3-18 CBCPR - LAN Connector Assignment (RJ45 Jack)

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.2.4 CBSAP

Introduction

The CBSAP board (**C**entral **B**oard **S**ynergy **A**ccess **P**latform) performs all central control and switching functions for HiPath 3800 (see Figure 3-4).

Subboards

The following subboards can be used depending on the application:

- CMS clock module (optional)
- MMC multimedia card
- IMODN integrated modem card new (optional)
- LIMS LAN interface module (optional)
  Contains two Ethernet (10/100BaseT) LAN connectors (8-pin RJ45 jacks):
  - LAN1 (administration via HiPath 3000 Manager E and CTI functions)
  - LAN2 (not assigned)
- MPPI music on hold (optional)

V.24 interfaces (9-pin SUB-D plug)

- Service (X50) = for connecting the service PC
- Application (X51) = for connecting a printer or application

Switches and indicators

- Reset/reload switch:
  - Switch pressed < 5 s = Reset activated
  - Switch pressed > 5 s = Reload activated (Fail LED (red) out indicates that a reload is in progress).
- Two LEDs indicating the board status:
  - Run (green) = signals the current status of the CBSAP board (see Table 12-2)
  - Fail (red) = error encountered

- Two LEDs for displaying the LAN interface status:
  - LED1:
    – Green = 100 Mbps online (link)
    – Yellow = 10 Mbps online (link)
    – Flashing = active
  - LED2 (green):
    – On = full-duplex (FDX)
    – Off = half-duplex

Diagram of CBSAP board

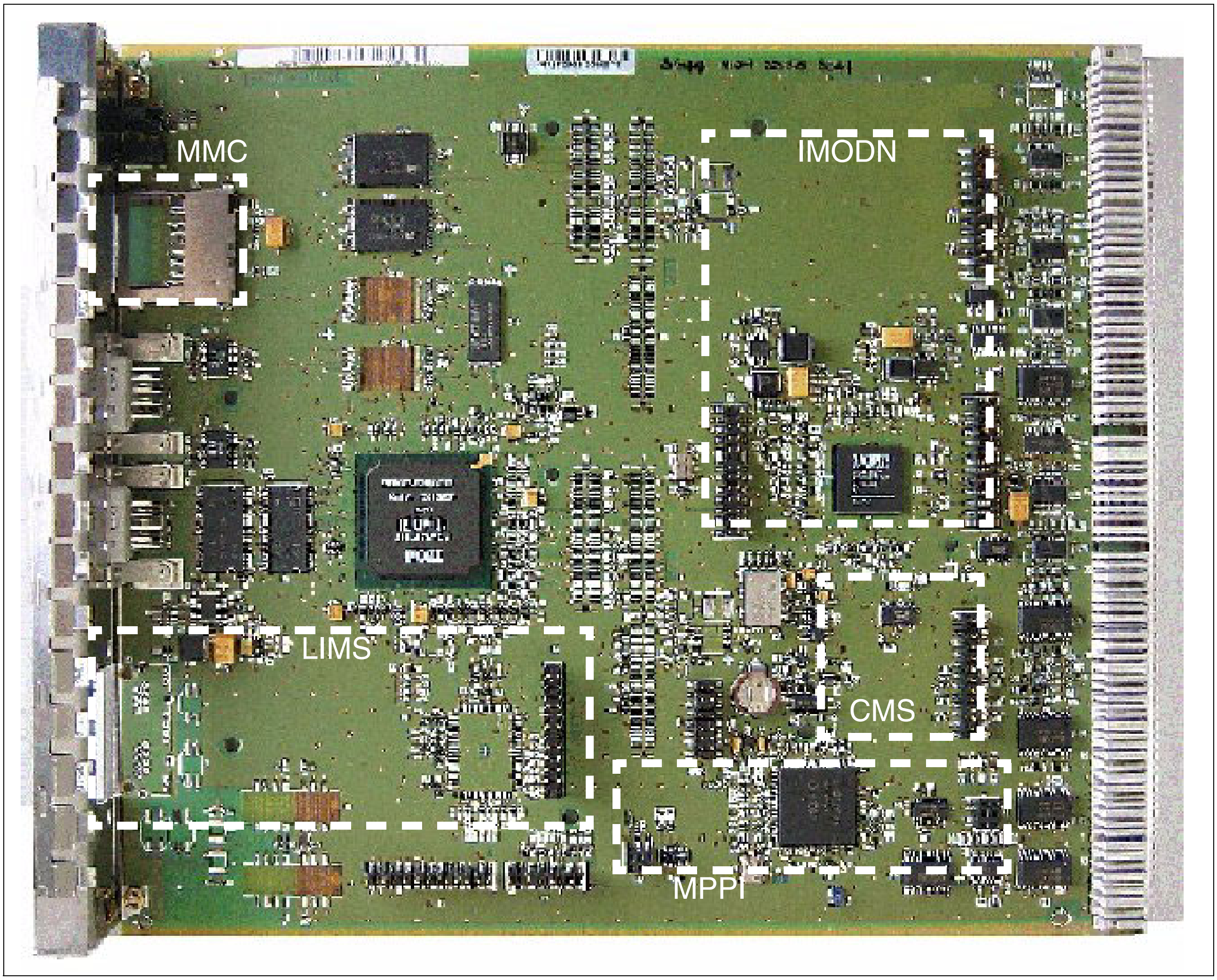
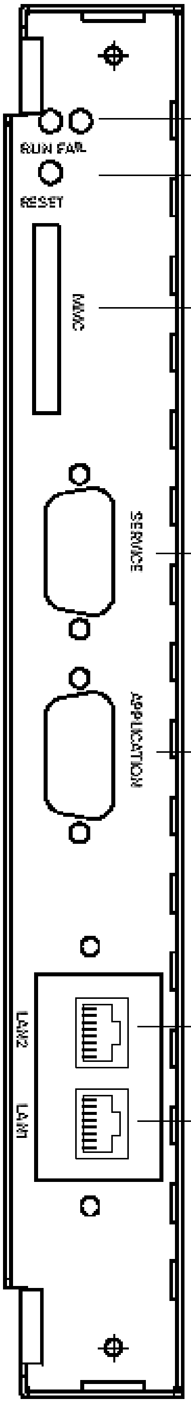


Figure 3-4 CBSAP Board (S30810-Q2314-X)

Front panel



Two LEDs indicating the board status:

- Run (green, flashing: 0.5 s on/0.5 s off) = error-free operation
- Fail (red) = error encountered

Reset/reload switch

Slide-in shelf for MMC

V.24 interfaces (9-pin SUB-D plug):

- Service (X50) = for connecting the service PC
- Application (X51) = for connecting a printer or application

Two Ethernet (10/100BaseT) LAN connectors (8-pin RJ45 jacks) via LIMS:

- LAN2 (not assigned)
- LAN1 (administration via HiPath 3000 Manager E and CTI functions)

The LAN interface status is indicated by two LEDs:

- LED1:
  - Green = 100 Mbps online (link)
  - Yellow = 10 Mbps online (link)
  - Flashing = active
- LED2 (green):
  - On = full-duplex (FDX)
  - Off = half-duplex

Figure 3-5 CBSAP - Front Panel

V.24 interface assignment

Table 3-19 CBSAP - V.24 Interface Assignment (SUB-D Plug)

X50/X51, Pin	Signal	Description
1	DCD	Data carrier detect (not used)
2	RxD	Receive data
3	TxD	Transmit data
4	DTR	Data terminal ready (not used)
5	0 V	Ground
6	DSR	Data send ready (not used)
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator (not used)

LAN connector assignment via LIMS

Table 3-20 CBSAP - LAN Connector Assignment (RJ45 Jack)

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.2.5 CMA

⚠ **Caution**
Place the central control board on a flat surface before inserting the CMA subboard. The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-6).
Otherwise you may damage the board.

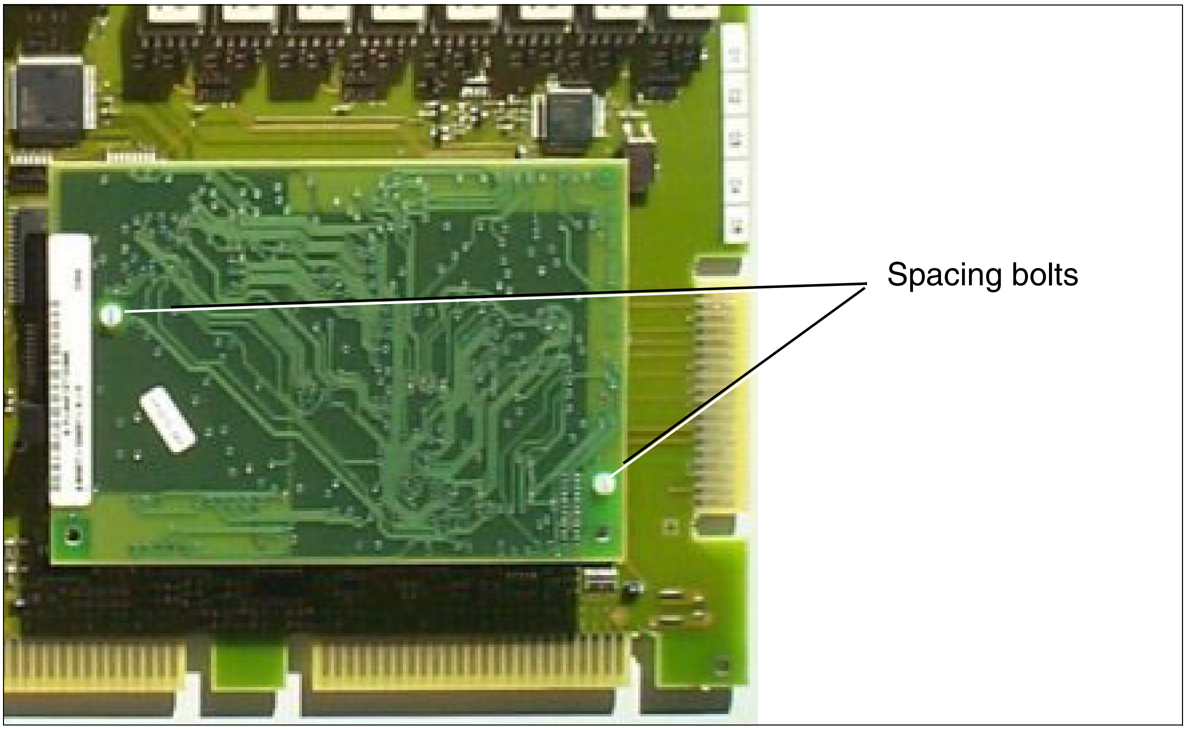


Figure 3-6 CMA with Spacing Bolts

Introduction

The **C**lock **M**odule **A**DPCM CMA (S30807-Q6931-X) is an optional subboard for the CBCC and CBRC central control boards. The CMA module is needed for special HiPath Cordless Office configurations.

All clock module small (CMS) functions are available when you insert a CMA module.

Please refer to Page 3-40 for recommendations on CMA module implementation.

3.2.6 CMS

Caution
Place the central control board on a flat surface before inserting the CMS subboard. The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-6).
Otherwise you may damage the board.

Introduction

The **C**lock **M**odule **S**mall CMS (S30807-Q6928-X) is an optional subboard for the HiPath 3000 central control boards and guarantees greater clock accuracy.

Recommendations for CMA and CMS utilization

Table 3-21 provides recommendations for the implementation of CMA and CMS subboards based on

- the type of network (ISDN S_0, ISDN S_{2M} or Ethernet/IP (10/100 BaseT))
- the trunk connection available (no trunk/analog trunk, ISDN S_0 or ISDN S_{2M}) and consequently, the possible provision of a digital reference clock
- HiPath Cordless Office

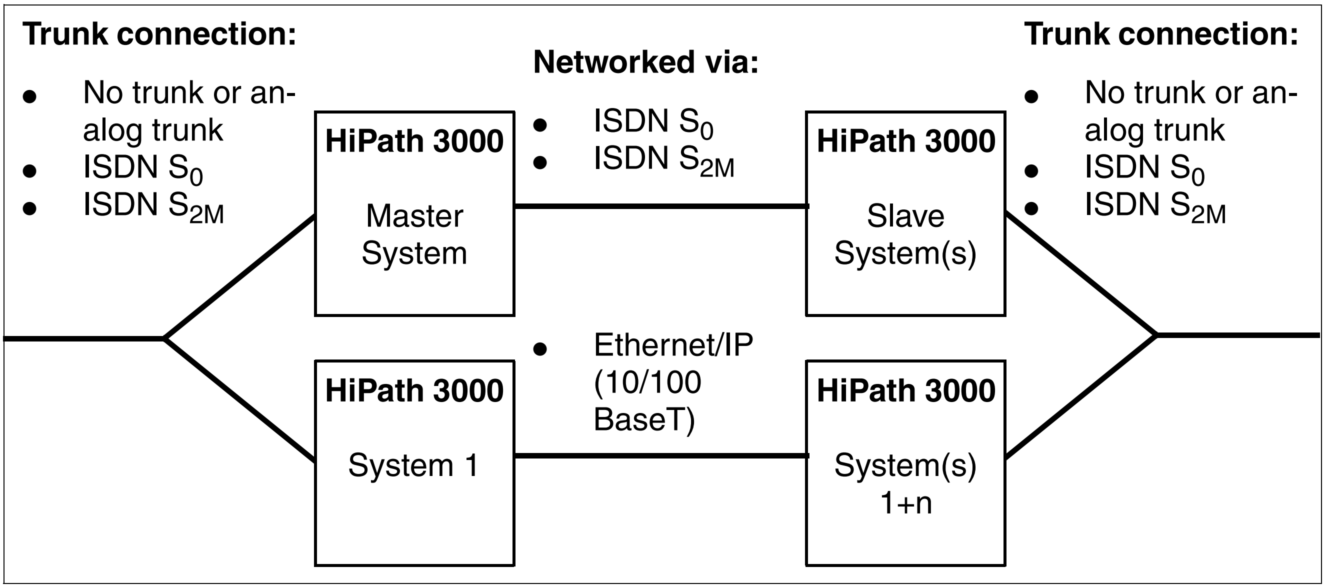

Trunk connection:
• No trunk or analog trunk
• ISDN S0
• ISDN S2M
Networked via:
• ISDN S0
• ISDN S2M
• Ethernet/IP (10/100 BaseT)
Trunk connection:
• No trunk or analog trunk
• ISDN S0
• ISDN S2M
HiPath 3000 Master System
HiPath 3000 Slave System(s)
HiPath 3000 System 1
HiPath 3000 System(s) 1+n

Figure 3-7 Networking Options for HiPath 3000 Systems

Table 3-21   Recommendations for CMA and CMS Utilization

Trunk connection	**Reference clock**	**HiPath Cordless Office**			**Trunk connection**	**Reference clock**	**HiPath Cordless Office**	
		No	**Yes**				**No**	**Yes**
Networking via ISDN S_0 lines:								
MASTER system					**SLAVE system(s)**			
No trunk or analog trunk	–	–	CMS or CMA (see Table 11-1)		No trunk or analog trunk	Via ISDN S_0 networking line	–	CMA[2]
ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS[1]	CMS or CMA (see Table 11-1)		ISDN S_0 (not always active)	Via ISDN S_0 networking line	–	CMA[2]
ISDN S_0 (always active)	Via ISDN S_0 trunk connection	CMS[1]	CMA[2]		ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA[2]
ISDN S_{2M}	Via ISDN S_{2M} trunk connection	CMS[1]	CMA[2]		ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA[2]

Table 3-21 Recommendations for CMA and CMS Utilization

Trunk connection	**Reference clock**	**HiPath Cordless Office**			**Trunk connection**	**Reference clock**	**HiPath Cordless Office**	
		No	**Yes**				**No**	**Yes**
Networking via ISDN S_{2M} lines:								
MASTER system					**SLAVE system(s)**			
No trunk or analog trunk	–	–	CMS or CMA (see Table 11-1)		No trunk or analog trunk	Via ISDN S_{2M} networking line	–	CMA^2
ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS^1	CMS or CMA (see Table 11-1)		ISDN S_0 (not always active)	Via ISDN S_{2M} networking line	–	CMA^2
ISDN S_0 (always active)	Via ISDN S_0 trunk connection	CMS^1	CMA^2		ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA^2
ISDN S_{2M}	Via ISDN S_{2M} trunk connection	CMS^1	CMA^2		ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA^2

Table 3-21 Recommendations for CMA and CMS Utilization

Trunk connection	**Reference clock**	**HiPath Cordless Office**		**Trunk connection**	**Reference clock**	**HiPath Cordless Office**	
		No	**Yes**			**No**	**Yes**
Networking via Ethernet/IP (10/100 BaseT) lines:							
System 1				**System(s) n+1**			
No trunk or analog trunk	–	CMS[3]	CMS or CMA (see Table 11-1)	No trunk or analog trunk	–	CMS[3]	CMS or CMA (see Table 11-1)
ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS[3]	CMS or CMA (see Table 11-1)	ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS[3]	CMS or CMA (see Table 11-1)
ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA[2]	ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA[2]
ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA[2]	ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA[2]

[1] CMS is not necessary if the reference clock supplied by the CO is **always** available via the networking lines (not a transparent clock).

[2] CMA is not necessary if ADPCM conversion is not needed for HiPath Cordless Office (see Table 11-1).

[3] CMS is not necessary but is recommended for the following reasons: Although an Ethernet link is an asynchronous connection, buffer overflow/underflow can cause transmission errors. To avoid this, the clock difference between the master and the slave systems should be as small as possible so that the receive and send buffer can be read and addressed at the same speed on both sides. The more accurate the clock source in the relevant systems, the fewer the faults.

3.2.7 CR8N

Introduction

The CR8N (**C**ode **R**eceiver) board is an optional plug-in module and can be used in any slot in all HiPath 3750 and HiPath 3700 cabinets.

The CR8N board is required when:

- A high outgoing traffic load and a large number of analog subscribers exist.
- A Hicom Phonemail system with more than six ports and the automatic attendant function is connected.
- An external automatic attendant is being used as a virtual attendant and the system has a large number of analog trunks.

In these cases, the six code receivers (for tone dialing on analog telephones) that are already present in the system on the CBCPR are not sufficient. Adding a CR8N board provides another eight code receivers and eight code transmitters. Up to two CR8Ns can be installed in each system. A CR8N board and a CR8 board (S30810-Q2513-X) cannot be used in the same system simultaneously.

You can also install or remove a CR8N board during operation. If you remove it while the system is in the operating state, you risk interrupting DTMF signal processing. It is always recommended that you remove or install the board only while the system is switched off.

Note the following recommendations for using the CR8N board if a Hicom Phonemail system, voice mail system, or automatic attendant is connected:

- Up to 8 ports: No CR8N board required.
- 9 to 24 ports: One CR8N board required.
- Over 24 ports: Two CR8N boards required.

These are general recommendations only. In some cases, a CR8N board may already be required for six ports under extreme load conditions.

Switches and LEDs

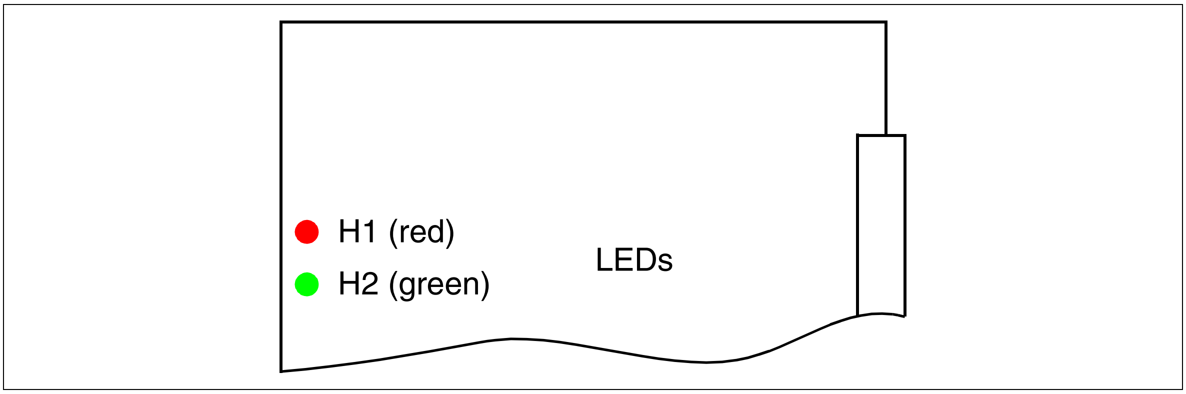


Figure 3-8 CR8N (S30810-Q2513-X100)

LED statuses and their meanings

Table 3-22 CR8N - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress.	Wait
		If the status does not change, the loadware did not load correctly. Board is faulty.	Replace board.
Flashing	Off	Loadware is being loaded.	
On	On	Board test unsuccessful, board is defective.	Replace board.
Off	On	Board test completed successfully. Board is OK (temporary transition).	
Off	Flashing	Board operational.	

3.2.8 CUC and CUCR

The backplane comes in two versions:

- CUC (**C**onnection **U**nit **C**om) S30777-Q750-X (Figure 3-9) - for use in HiPath 3550 (wall housing)
- CUCR (**C**onnection **U**nit **C**om **R**ack) S30777-Q750-Z (Figure 3-10) - for use in HiPath 3500 (19-inch housing)

CUC connector designations and slot assignments (S30777-Q750-X)

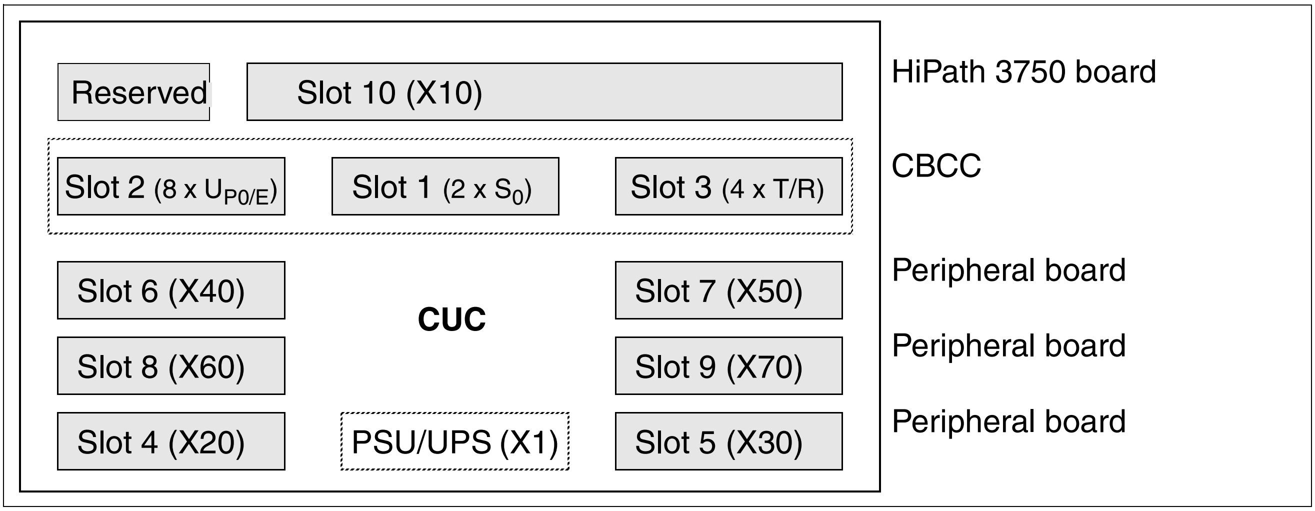

Reserved
Slot 10 (X10)
HiPath 3750 board
Slot 2 (8 x $U_{P0/E}$)
Slot 1 (2 x S_0)
Slot 3 (4 x T/R)
CBCC
Slot 6 (X40)
CUC
Slot 7 (X50)
Peripheral board
Slot 8 (X60)
Slot 9 (X70)
Peripheral board
Slot 4 (X20)
PSU/UPS (X1)
Slot 5 (X30)
Peripheral board

Figure 3-9 CUC Backplane (S30777-Q750-X)

CUCR connector designations and slot assignments (S30777-Q750-Z)

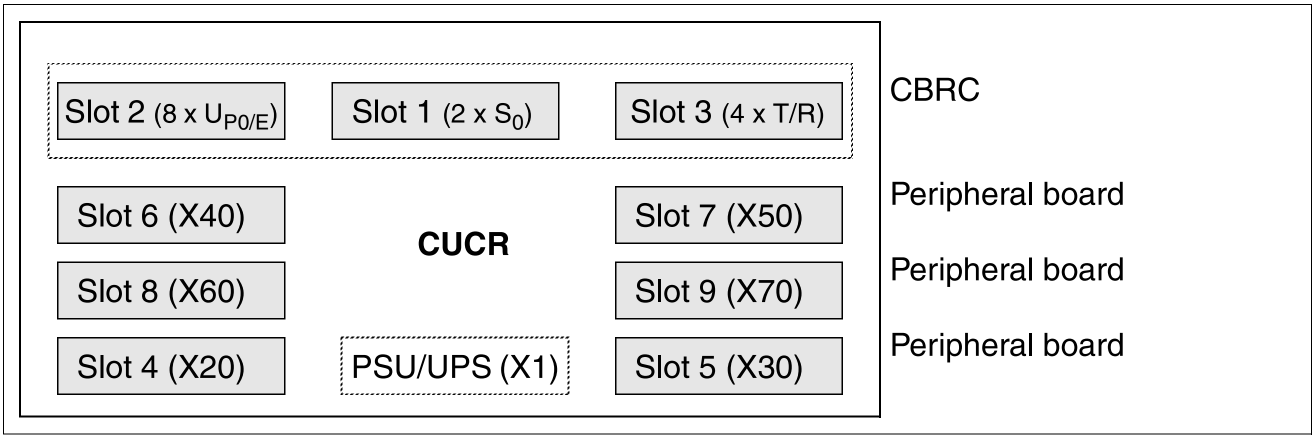

Slot 2 (8 x $U_{P0/E}$)
Slot 1 (2 x S_0)
Slot 3 (4 x T/R)
CBRC
Slot 6 (X40)
CUCR
Slot 7 (X50)
Peripheral board
Slot 8 (X60)
Slot 9 (X70)
Peripheral board
Slot 4 (X20)
PSU/UPS (X1)
Slot 5 (X30)
Peripheral board

Figure 3-10 CUCR Backplane (S30777-Q750-Z)

3.2.9 CUP and CUPR

The backplane comes in two versions:

- CUP (**C**onnection **U**nit **P**oint) S30777-Q751-X (Figure 3-11) - for use in HiPath 3350 (wall housing)
- CUPR (**C**onnection **U**nit **P**oint **R**ack) S30777-Q751-Z (Figure 3-12) - for use in HiPath 3300 (19-inch housing)

CUP connector designations and slot assignments (S30777-Q751-X)

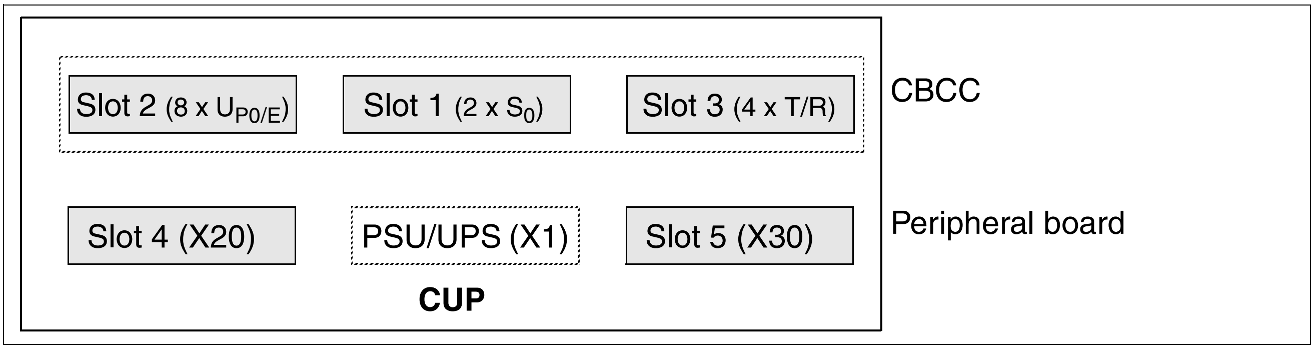

Slot 2 (8 x $U_{P0/E}$)
Slot 1 (2 x S_0)
Slot 3 (4 x T/R)
CBCC
Slot 4 (X20)
PSU/UPS (X1)
Slot 5 (X30)
Peripheral board
CUP

Figure 3-11 CUP Backplane (S30777-Q751-X)

CUPR connector designations and slot assignments (S30777-Q751-Z)

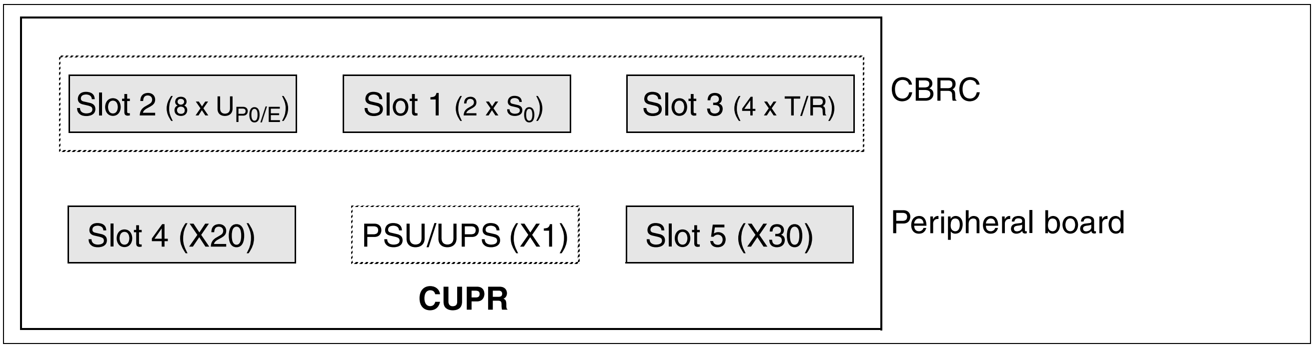
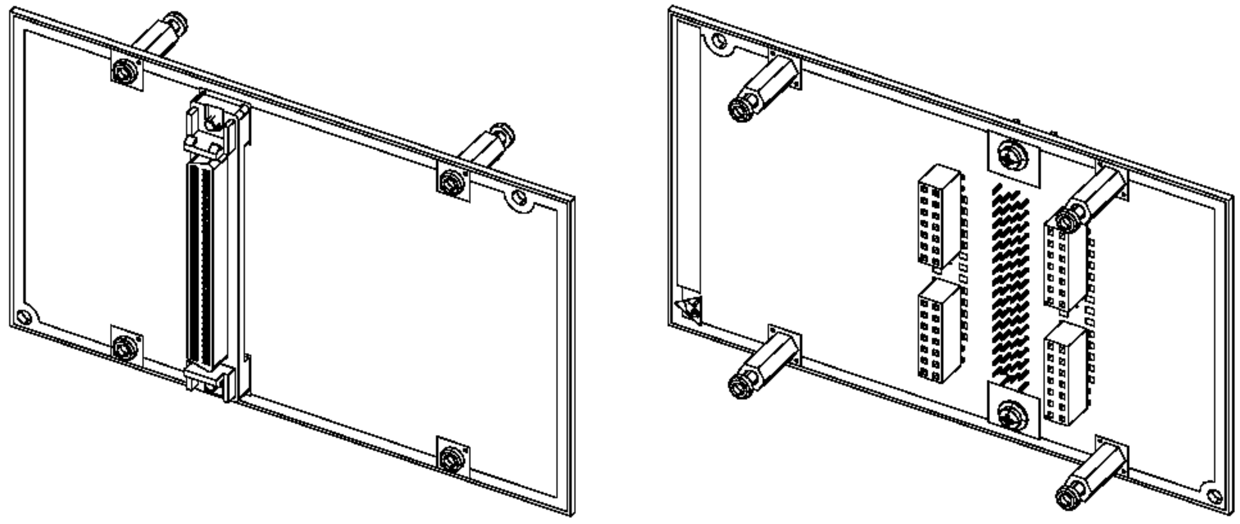

Slot 2 (8 x $U_{P0/E}$)
Slot 1 (2 x S_0)
Slot 3 (4 x T/R)
CBRC
Slot 4 (X20)
PSU/UPS (X1)
Slot 5 (X30)
Peripheral board
CUPR

Figure 3-12 CUPR Backplane (S30777-Q751-Z)

3.2.10 DBSAP

A prerequisite for expanding HiPath 3800 to a two-cabinet system is that the DBSAP (**D**river **B**oard for **S**ynergy **A**ccess **P**latform) board is mounted on the backplane of the expansion cabinet.

DBSAP ensures that the expansion cabinet receives HDLC, PCM and clock signals from the basic cabinet. In addition, an ID signal is created which indicates the availability of an expansion cabinet to the CBSAP.



Front
With 68-pin DB68 mini-jack for connecting the connection cable to the basic cabinet

Back
With four jacks for plugging into the backplane of the expansion cabinet

Figure 3-13 DBSAP (S30807-Q6722-X)

The cable (C39195-Z7611-A10) is used as the connection cable between basic cabinet (X201 jack) and expansion cabinet (DBSAP board). To ensure smooth operation, use only shielded cables with a maximum length of 1 m.

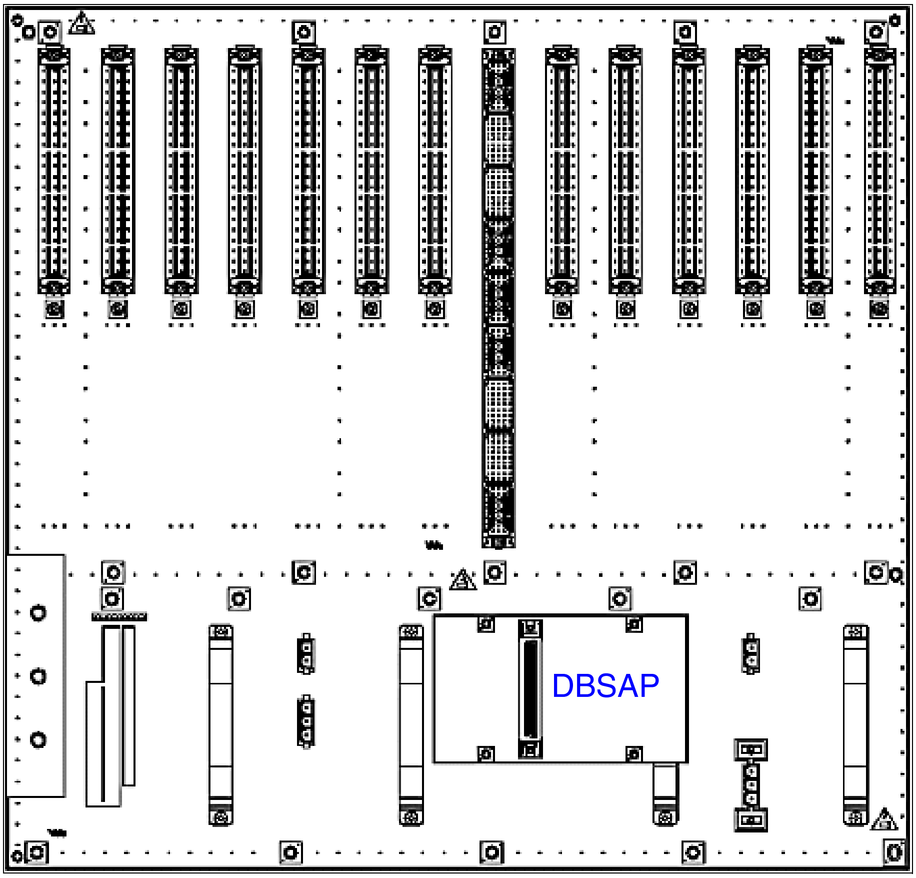


Figure 3-14 DBSAP on the Backplane of the Expansion Cabinet

3.2.11 IMODN

⚠ **Caution**
Place the central control board on a flat surface before inserting the IMODN subboard.
The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-6).
Otherwise you may damage the board.

Introduction

The **I**ntegrated **Mod**em Card **N**ew (IMODN - S30807-Q6932-X100) is an optional subboard for HiPath 3000 central control boards.

It permits the use of remote service (analog mode up to 33.6 Kbps) over analog trunks without an external modem.

IMODN is the compatible successor of IMODC. Functional differences between both modules only exist in the higher transmission speed of the IMODN.

Loadable loadware

To avoid exchanging the IMODN subboard during a software upgrade, IMODN loadware is automatically updated in V4.0 SMR-08 and later.

Updating the IMODN loadware takes approx. 10 minutes beginning with the idle system status. The red LED on the IMODN lights up repeatedly during the loading procedure. IMODN is ready as soon as the green LED starts to flash.

If the IMODN loadware is not updated when the system is reset, the green LED starts to flash approx. 10 seconds after the reset. The green LED continues to flash after the system boot.

3.2.12 LIM

⚠ **Caution**
The LAN interface module must not be plugged in or out when the system is energized.
Place the central control board on a flat surface before inserting the LIM subboard.
The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-6).
Otherwise you may damage the board.

Introduction

The **L**AN **I**nterface **M**odule (LIM - S30807-Q6930-X) is an optional plug-in card for all HiPath 3000 central control boards apart from CBSAP (HiPath 3800).

The board provides an Ethernet (10BaseT/10 Mbps) LAN connection via an 8-pin RJ45 jack.

The LIM module can be used for administration via HiPath 3000 Manager E and for CTI functions (TAPI 120 V2.0). However, bear in mind that the number of BHCAs (Busy Hour Call Attempts = number of connection attempts during busy traffic hours) is restricted to 400 at a maximum of six TAPI ports. The use of "power dialers" is not approved.

You cannot operate the LIM module and a HG 1500 board simultaneously in a HiPath 3000.

RJ45 jack assignment

Table 3-23 LIM - RJ45 Jack Assignment

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

LAN connection in HiPath 3750 and HiPath 3700

Make the LAN connection using the adapter cable and a standard patch cable, which is to be stripped and fastened to the grill on the backplane as shown in Figure 3-15.

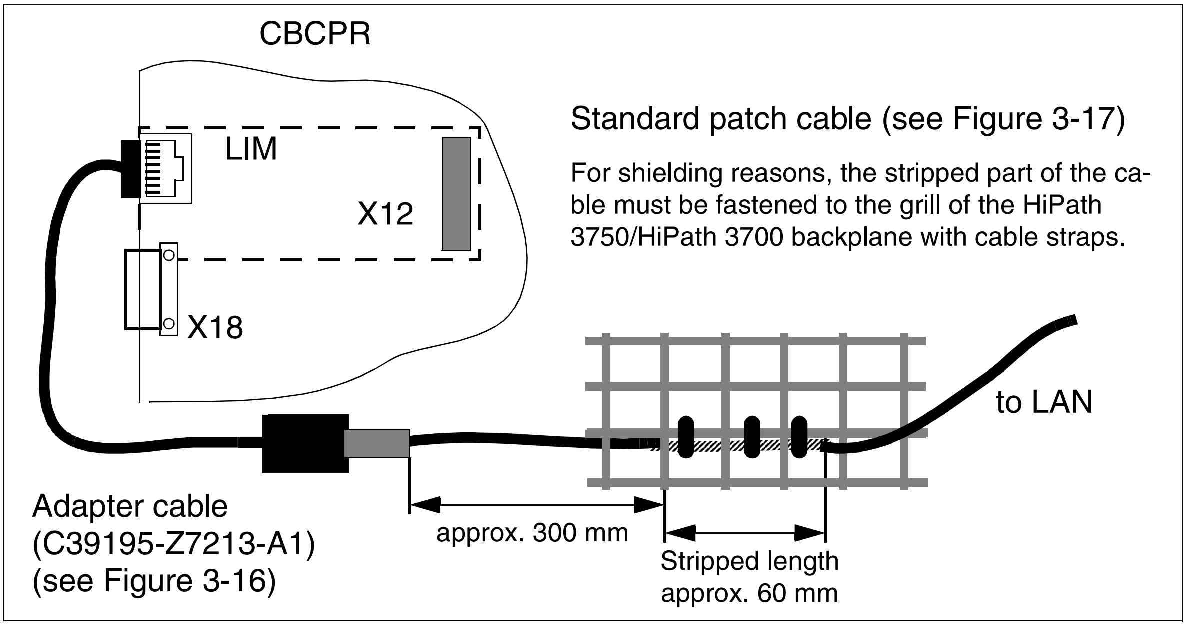

CBCPR
LIM
X12
X18
Standard patch cable (see Figure 3-17)
For shielding reasons, the stripped part of the cable must be fastened to the grill of the HiPath 3750/HiPath 3700 backplane with cable straps.
to LAN
Adapter cable
(C39195-Z7213-A1)
(see Figure 3-16)
approx. 300 mm
Stripped length
approx. 60 mm

Figure 3-15 LIM in HiPath 3750 and HiPath 3700 - Procedure for LAN Connection

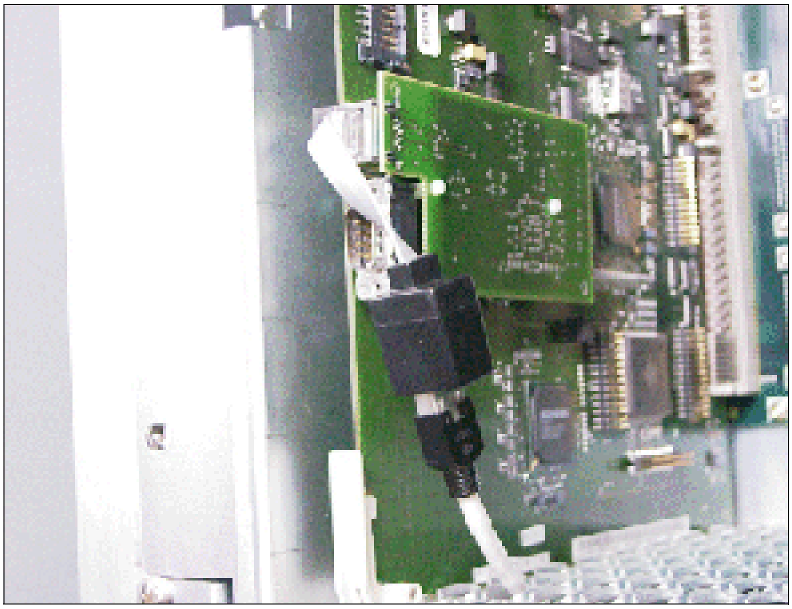


Figure 3-16 LIM in HiPath 3750 and HiPath 3700 - Adapter Cable (C39195-Z7213-A1)

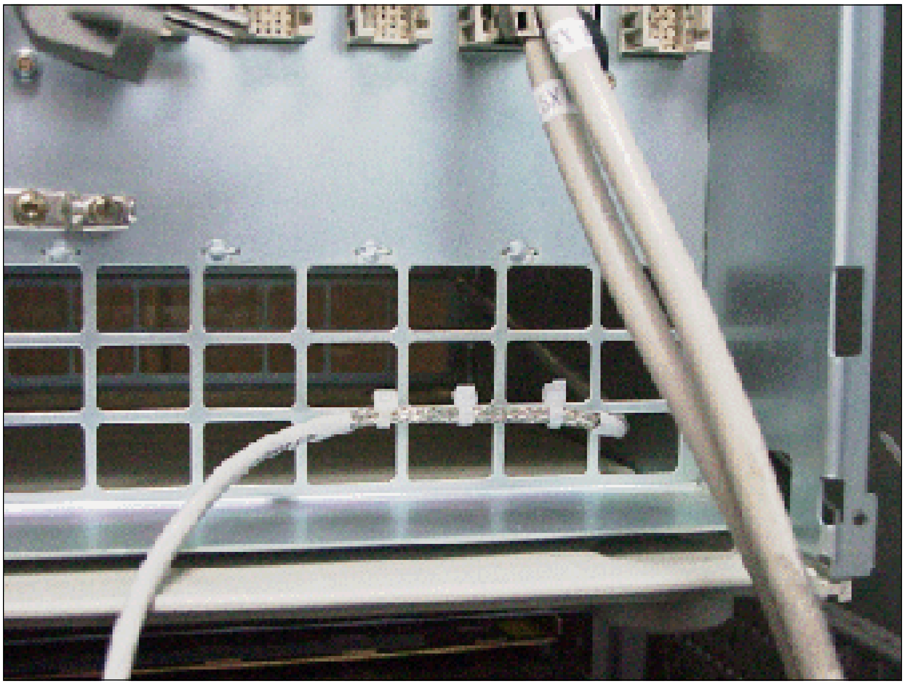


Figure 3-17 LIM in HiPath 3750 and HiPath 3700 - Attachment of the Patch Cable to the Backplane Grill

3.2.13 LIMS

Caution
The LIMS module must not be plugged in or out when the system is energized.

Introduction

The **L**AN **I**nterface **M**odule for **S**APP LIMS (S30807-Q6721-X) is an optional plug-in card for the CBSAP central control board in HiPath 3800.

The board provides two Ethernet (10/100BaseT) LAN connectors via two 8-pin RJ45 jacks:

- LAN1 (administration via HiPath 3000 Manager E and CTI functions)
- LAN2 (not assigned)

The LIMS module can be used for administration via HiPath 3000 Manager E and for CTI functions (TAPI 120 V2.0). However, bear in mind that the number of BHCAs (Busy Hour Call Attempts = number of connection attempts during busy traffic hours) is restricted to 400 at a maximum of six TAPI ports. The use of "power dialers" is not approved.

You cannot operate the LIMS module and an STMI2 board simultaneously in a HiPath 3800.

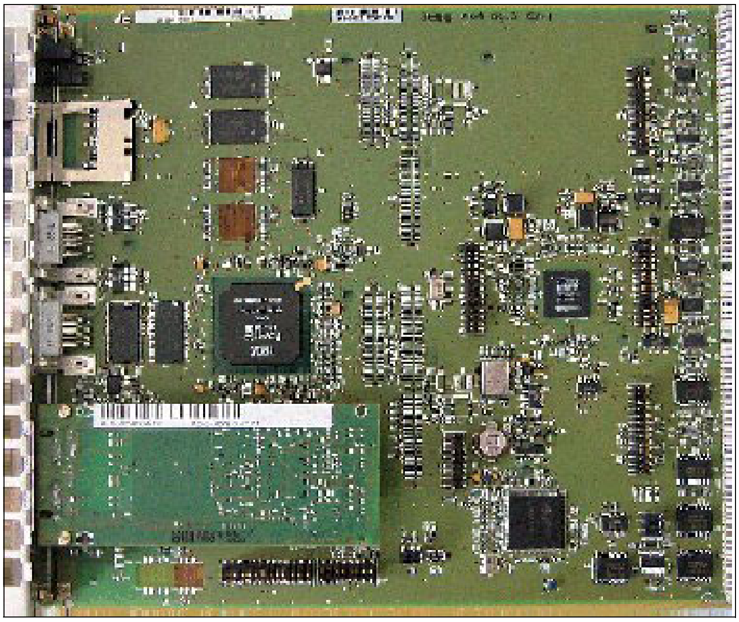


Figure 3-18 CBSAP with LIMS Module Plugged In

RJ45 jack assignment

Table 3-24 LIMS - RJ45 Jack Assignment

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.2.14 LUNA2

Introduction

LUNA2 (**L**ine-powered **U**nit for **N**etwork-based **A**rchitecture No. **2**) is used as the central power supply in HiPath 3800. Depending on the system configuration up to three LUNA2 modules can be used in the basic cabinet and up to four LUNA2 modules can be used in the expansion cabinet.

When expanding the HiPath 3800 to a two-cabinet system, two LUNA2 modules in the basic cabinet and three LUNA2 modules in the expansion cabinet are enough to supply the maximum configuration in Table 2-7. For information on how to calculate the number of LUNA2 modules required, see Page 3-62.

You can use a third LUNA2 in the basic cabinet and a fourth in the expansion cabinet to

- ensure error-free operation if one LUNA2 module fails (redundant LUNA2).
- load a connected battery pack or a battery cabinet.

LUNA2 supports power supply and battery management functions. No other components are required if it is operated as a power supply. To maintain short-term battery emergency operation after a power failure, that is, to use uninterruptible power supply functions, you must also connect a battery pack per system cabinet or a BSG 48/38 battery cabinet (including battery charger).

LUNA2 is used in all countries.

Licensed batteries

S30122-K5950-Y200: Battery pack 4 x 12 V/7 Ah
This is the only battery pack approved for operation with LUNA2.

Part numbers

- LUNA2: S30122-K7686-L1, S30122-K7686-M1
  For production-related reasons, two different LUNA2 modules with the same functions are used. Technically identical, the two models have minor mechanical differences and are fully compatible with each other.
- Battery pack 4 x 12 V/7 Ah: S30122-K5950-Y200
  (the connection cable for LUNA2 is part of the battery pack)
- Battery cabinet BSG 48/38: S30122-K5950-F300 (Page 3-63)
  - Battery cable for BSG 48/38: S39195-A7985-B10
    (A battery cable is required for each system cabinet to be connected.)
  - Battery 12 V/38 Ah: S30122-X5950-F320
    (Four batteries necessary for each BSG 48/38.)

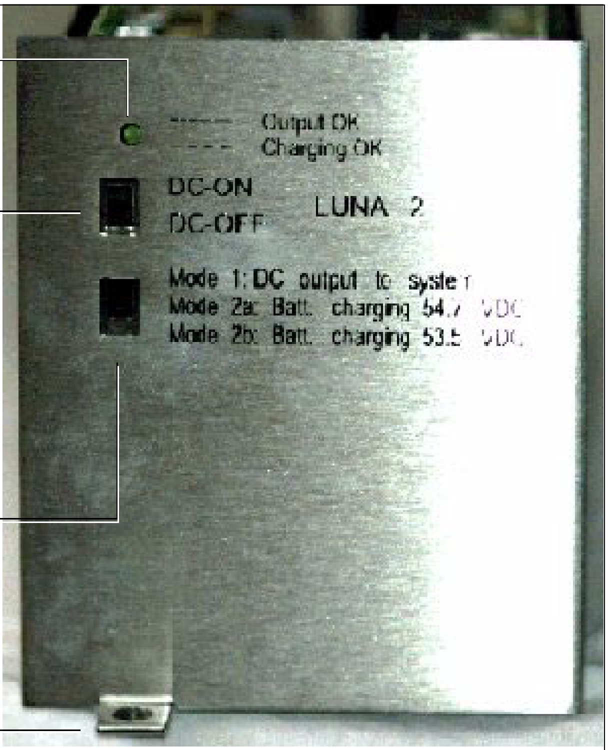
Technical specifications

- Nominal voltage range: 110 VAC - 240 VAC
- Nominal frequency: 50 Hz - 60 Hz
- Output voltage (battery charging voltage, if a LUNA2 is used as a battery charger): –54.7 VDC; –53.5 VDC (for gell cell batteries, currently not released)
- Output current (battery charge current, if a LUNA2 is used as a battery charger): up to 2 A
- Bridging times
  Table 3-25 lists the maximum possible bridging times (emergency battery operation in case of power failure) with battery pack S30122-K5950-Y200 ((48 V/7 Ah) and battery housing BSG 48/38 (S30122-K5950-F300).

Table 3-25 LUNA2 - Bridging Times with Battery Pack 48 V/7 Ah and Upright Battery Housing BSG 48/38

System	Power supply unit	Load levels	Maximum bridging time
HiPath 3800	2 x LUNA2 per system cabinet as PSU 1 x LUNA2 per system cabinet as battery charger 1 x battery pack 48 V/7 Ah per system cabinet	60 % nominal load	25 min
HiPath 3800	5 x LUNA2 per system 1 x BSG 48/38 upright battery housing per system (LUNA2 is not required as a battery charger as the BSG 48/38 battery cabinet features a built-in charger.)	60 % nominal load	1 h 30 min
Measurement conditions: ● All measurements were performed at a room temperature of approximately 22 °C (71.6 °F). ● The batteries were new and fully charged when measurement started.			

Front view of LUNA2 with indicators and switches


Output OK
Charging OK
DC-ON
DC-OFF
LUNA 2
Mode 1: DC output to system
Mode 2a: Batt. charging 54.7 VDC
Mode 2b: Batt. charging 53.5 VDC

LED for displaying the operating status

ON/OFF switch for secondary operating voltages (system supply voltages)
LUNA2 can only be plugged in or out when the system is switched off (switch = DC-OFF)

Switches for setting the operating mode

Removal tab
You can use a screwdriver here to remove the LUNA2 from the shelf.

Figure 3-19 LUNA2 Front Panel

- LED for displaying the operating status:
  - Illuminated = LUNA2 is operating as power supply unit
  - Flashing = LUNA2 is operating as a battery charger
  - Off = At least one secondary operating voltage is outside the tolerance zone. In this case
    a) the voltage feed for LUNA2 may not be sufficient (an additional LUNA2 module is required. For information on how to calculate the number of LUNA2 modules required, see Page 3-62).
    b) LUNA2 may be defective (the board must be replaced).

- ON/OFF switch for secondary operating voltages (system supply voltages)

> **Caution**
> The switches for deactivating the secondary operating voltage (system supply voltage) must be set to "DC-OFF" on all LUNA2s during maintenance work that requires the system to be de-energized (for example, central board replacement). **The system is only in de-energized state if the switches on ALL LUNA2s are set to “DC-OFF” position.**
> The system is only restarted if all LUNA2 switches are returned to the “DC-ON” position.

- Switches for setting the operating mode (the operating mode must be set before the outer panel is mounted):
  - Mode 1: For use as power supply (LED illuminated)
  - Mode 2a: For use as battery charger (LED flashing) with a charging voltage of 54.7 Vdc
  - Mode 2b: For use as battery charger (LED flashing) with a charging voltage of 53.5 Vdc

> Mode 1 should always be set for the power supply units plugged in at LUNA2 slots 1, 2 and 3 (expansion cabinet only).
> The following applies to the power supply unit plugged in at the LUNA2 slot marked “4”:
> - Set to mode 1 if this module is to be used for LUNA2 redundancy.
> - Set to mode 2a or 2b if this LUNA2 module is to be used as a battery charger.

Slots

Push the LUNA2 power supply unit into the slots provided in the lower part of the system cabinet shelf until you hear a click (see Figure 4-18).

The power supply unit slots must be covered with the outer panel shown in Figure 3-20 (basic cabinet) and in Figure 3-21 (expansion cabinet) before the system is started up.

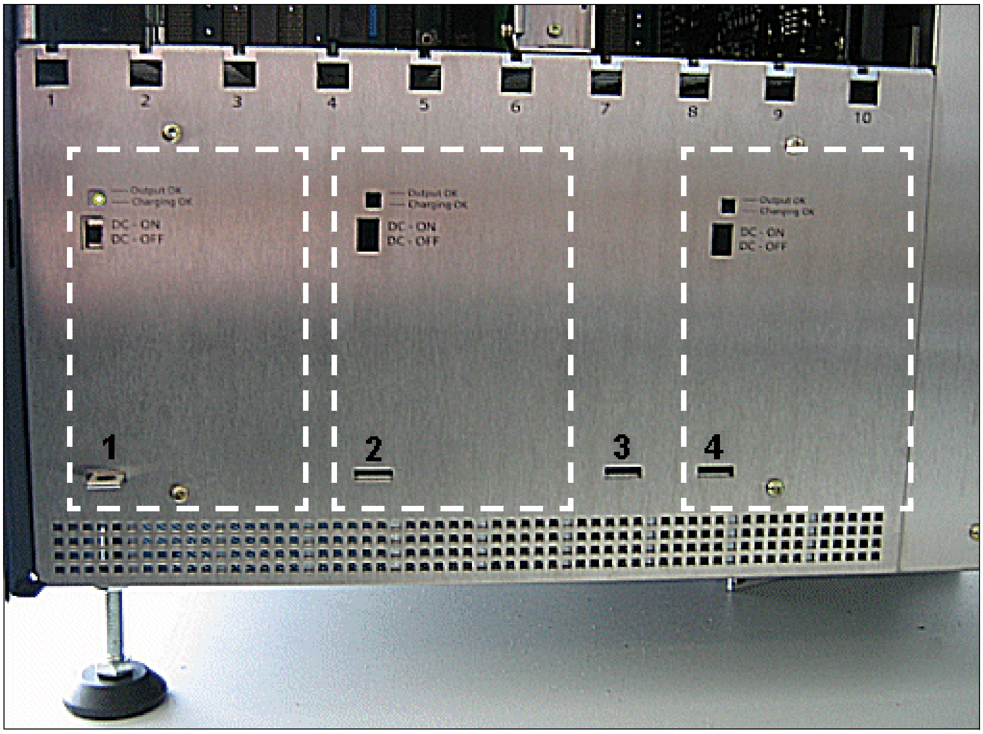

1
2
3
4
5
6
7
8
9
10
Output OK
Charging OK
DC - ON
DC - OFF
Output OK
Charging OK
DC - ON
DC - OFF
Output OK
Charging OK
DC - ON
DC - OFF
1
2
3
4

Figure 3-20 LUNA2 Slots in the Basic Cabinet (With Outer Panel Mounted)

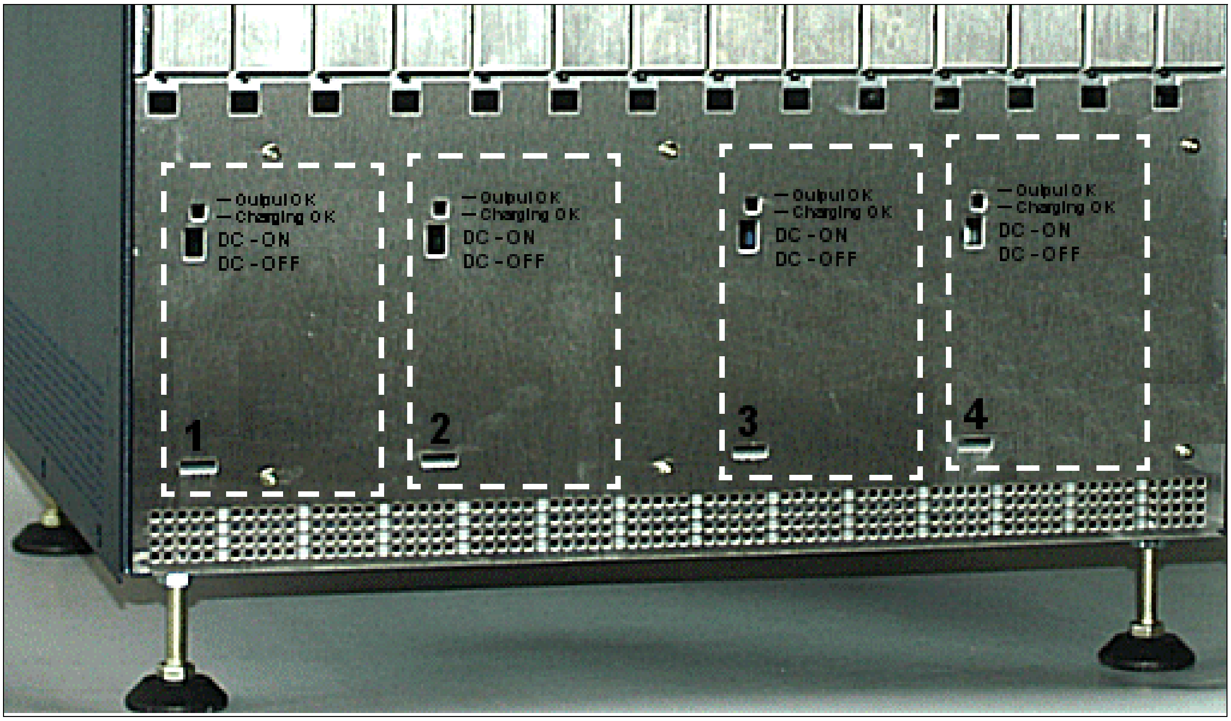

Output OK
Charging OK
DC - ON
DC - OFF
1
Output OK
Charging OK
DC - ON
DC - OFF
2
Output OK
Charging OK
DC - ON
DC - OFF
3
Output OK
Charging OK
DC - ON
DC - OFF
4

Figure 3-21 LUNA2 Slots in the Expansion Cabinet (With Outer Panel Mounted)

Calculating the number of LUNA2 modules required

The number of LUNA2 modules required in relation to the number and type of peripheral boards installed can be calculated using the following table.

Table 3-26 Determining the Number of LUNA2 Modules Required Per Cabinet

	Number of peripheral boards per cabinet	**STMI2, SLMA and/or SLCN available**	**Number of LUNA2s required per cabinet**
Basic cabinet	< 5	No	**1**
	< 5	Yes	**2**
	≥ 5	No	**2**
	≥ 5	Yes	**2**
Expansion cabinet	< 5	No	**1**
	< 5	Yes	**2**
	≥ 5	No	**2**
	≥ 5	Yes	**3**
	≥ 10	No	**3**
	≥ 10	Yes	**3**

Examples for a one-cabinet system:

a) Basic cabinet with CBSAP and peripheral boards (without STMI2, SLMA or SLCN)

- A single LUNA2 can supply a CBSAP and up to four peripheral boards.
- A second LUNA2 is required for five or more peripheral boards.
- A third LUNA2 can be used as a battery charger or as a redundant LUNA2.

b) Basic cabinet with CBSAP and peripheral boards (with STMI2, SLMA and/or SLCN)

- Two LUNA2s are always required to supply a CBSAP, peripheral boards and STMI2, SLMA and/or SLCN.
- A third LUNA2 can be used as a battery charger or as a redundant LUNA2.

BSG 48/38

You can use a BSG 48/38 battery cabinet instead of the battery pack to extend the bridging time in the event of a power failure. The BSG 48/38 battery cabinet (S30122-K5950-F300) consists of

- an upright housing
- a charging rectifier
- a battery set (38 Ah/48 V)

The battery cabinet is designed for direct connection to the HiPath 3800 communication system. The DC power cable (S39195-A7985-B10) provided lets you connect any system cabinet to the battery cabinet (do not connect to extension cables). Figure 3-23 is a schematic display of the connections between the battery cabinet BSG 48/38 and HiPath 3800.

> For detailed information about safety precautions as well as using and connecting the battery cabinet, refer to the installation and startup instructions that came with the cabinet.

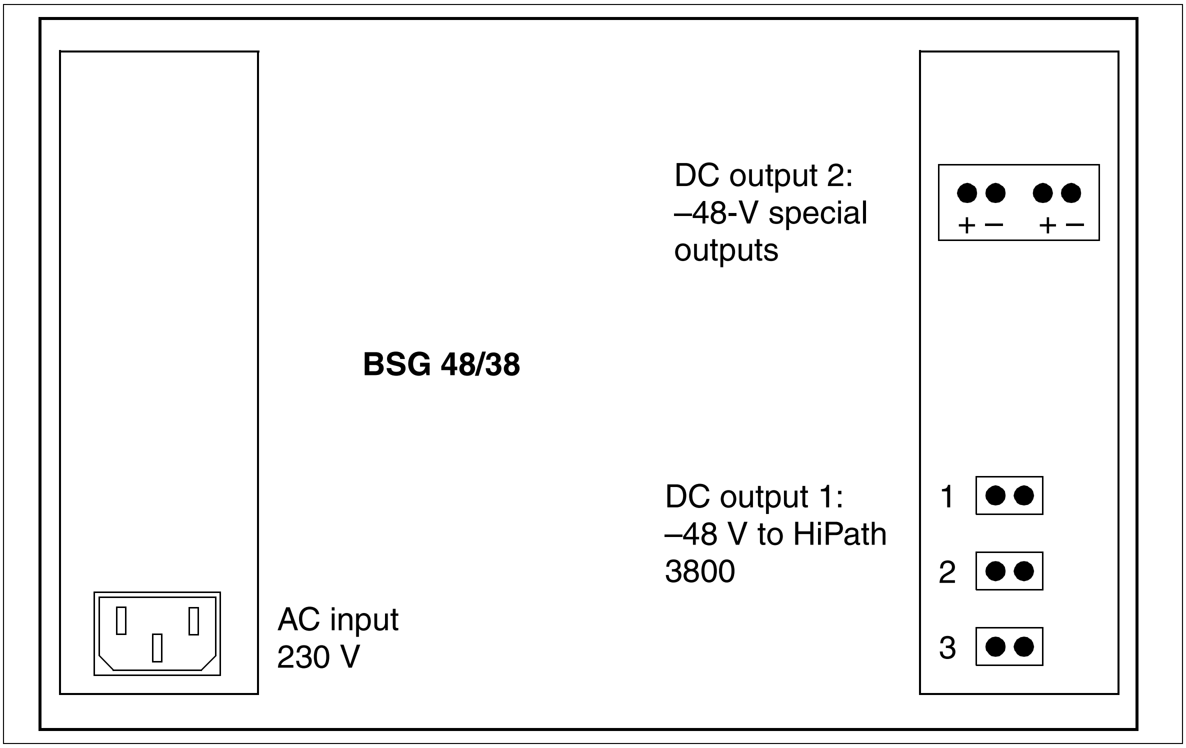
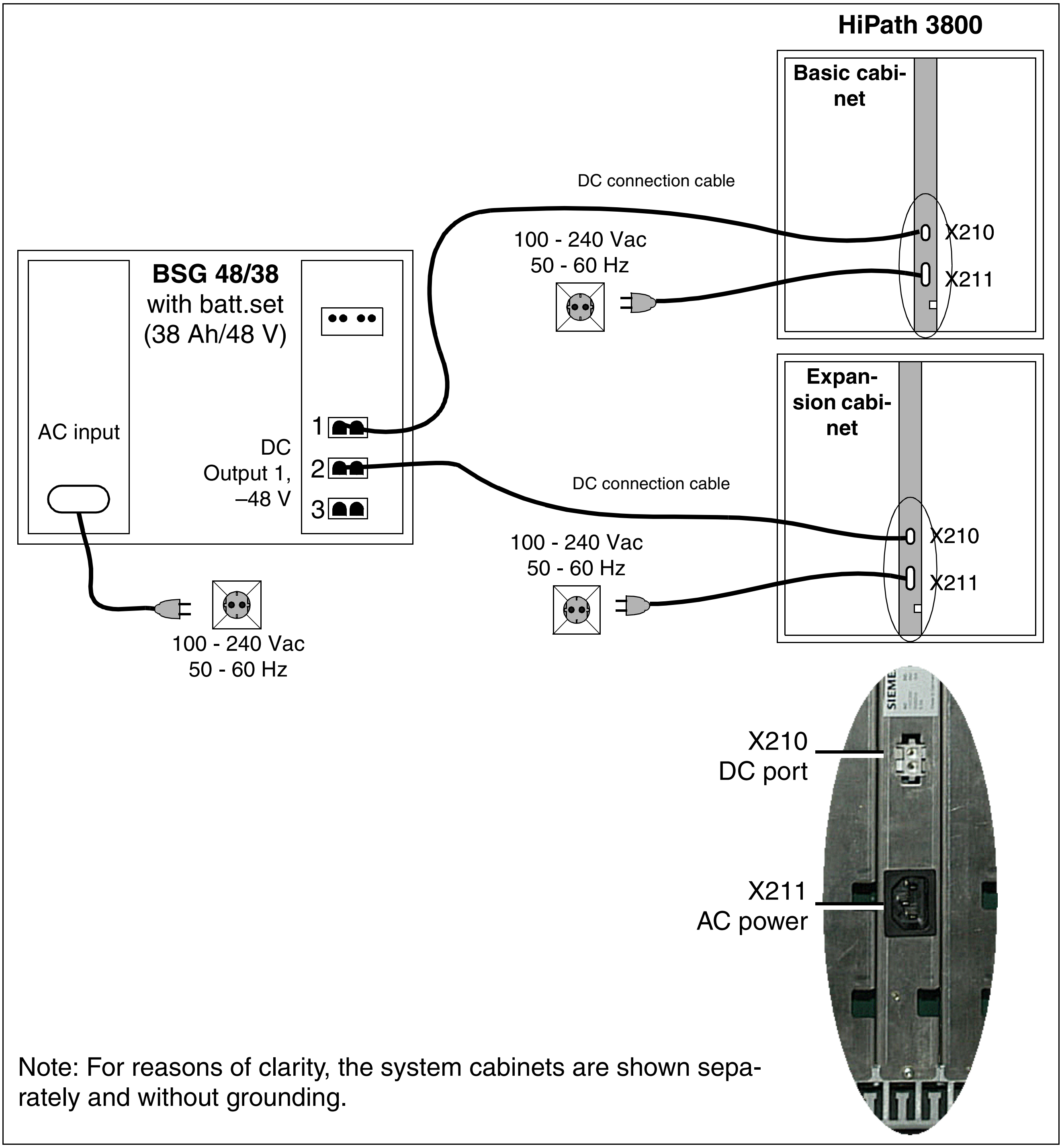


Figure 3-22 Rear View of the BSG 48/38 Battery Cabinet (S30122-K5950-F300)


HiPath 3800
Basic cabi-net
DC connection cable
X210
X211
100 - 240 Vac
50 - 60 Hz
BSG 48/38
with batt.set
(38 Ah/48 V)
AC input
DC
Output 1,
–48 V
1
2
3
Expan-sion cabi-net
DC connection cable
100 - 240 Vac
50 - 60 Hz
X210
X211
100 - 240 Vac
50 - 60 Hz
X210
DC port
X211
AC power

Note: For reasons of clarity, the system cabinets are shown separately and without grounding.

Figure 3-23 Connections Between the BSG 48/38 Battery Cabinet and HiPath 3800

3.2.15 MMC

Introduction

The **M**ulti **M**edia **C**ard (MMC) is a plug-in memory card for the central control boards and contains the CDB backup and the relevant version-specific application processor software (APS).

Please note that the MMC may only be replaced by a multimedia card approved by Siemens AG. Cards that have not been approved may have a different internal structure which can affect temporal access and certain features (for example, CDB backup and APS transfer).

Table 3-27 Multimedia Card Models and Applications

MMC	**Part number**	**Application in countries**	**Application in HiPath 3000**								
			HiPath 3800	**HiPath 3750**	**HiPath 3550**	**HiPath 3350**	**HiPath 3350 with CBCC**	**HiPath 3700**	**HiPath 3500**	**HiPath 3300**	**HiPath 3300 with CBRC**
HiPath 3000 Version 3.0											
MMC16 (16 MB)	S30122-X7424-X (= empty basic MMC)	ROW		X	X	X	X	X	X	X	X
	P30370-P1031-A816			X				X			
	P30370-P1032-A816				X		X		X		X
	P30370-P1033-A816					X				X	
HiPath 3000 Version 4.0											
MMC16 (16 MB)	S30122-X7424-X (= empty basic MMC)	ROW		X	X	X	X	X	X	X	X
	P50038-P1009-A816					X				X	
	P50038-P1010-A816				X		X		X		X
	P50038-P1011-A816			X				X			
MMC64 (64 MB)	S30122-X8002-X10 (= empty basic MMC)	ROW		X	X	X	X	X	X	X	X
	P50038-P1010-A864				X	X	X		X	X	X
	P50038-P1011-A864			X				X			

Table 3-27 Multimedia Card Models and Applications

MMC	Part number	Application in countries	Application in HiPath 3000								
			HiPath 3800	HiPath 3750	HiPath 3550	HiPath 3350	HiPath 3350 with CBCC	HiPath 3700	HiPath 3500	HiPath 3300	HiPath 3300 with CBRC
HiPath 3000 Version 5.0											
MMC64 (64 MB)	S30122-X8002-X10 (= empty basic MMC)	ROW	X	X	X	X	X	X	X	X	X
	P50038-P1053-A816		X								
	P50038-P1054-A816			X	X	X	X	X	X	X	X

3.2.16 PSUP

Introduction

The power supply PSUP S30122-K5658-M (Figure 3-24) is used in HiPath 3350 (wall housing). The device plugs into a special slot and is secured by screws. It connects to the power outlet using a modular power cord.

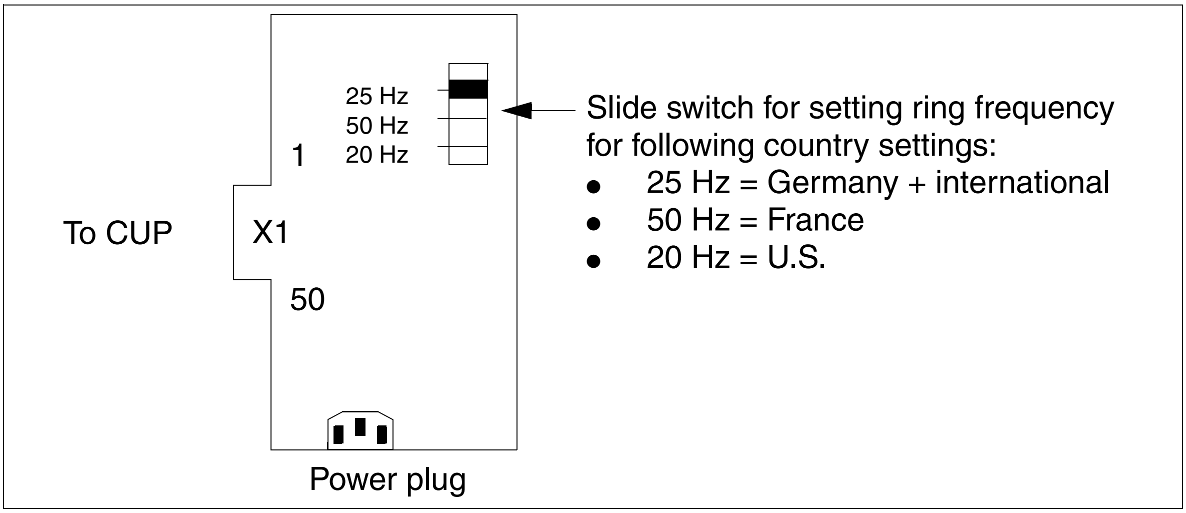
A monitoring LED indicates the presence of the 5-V output voltage.

Technical specifications

- Nominal voltage range: 100 VAC - 240 VAC
- Nominal frequency: 50 Hz - 60 Hz
- Ring generator: 75 VAC, 20/25/50 Hz
- Partial voltages: +5 Vdc, –48 V
- Power consumption: 70 W

> ⚠ **Caution**
> System voltage can only be switched on or off by plugging in or out the power plug.

PSUP interfaces (S30122-K5658-M)



Slide switch for setting ring frequency for following country settings:
- 25 Hz = Germany + international
- 50 Hz = France
- 20 Hz = U.S.

Figure 3-24 PSUP Interface (S30122-K5658-M)

3.2.17 UPSC-D

Introduction

The UPSC-D S30122-K5660-M300 board (Figure 3-25) is used in HiPath 3550 and HiPath 3350 (wall housing).

This module supports power supply and battery management functions. No other components are required if it is operated as an AC power supply. To maintain short-term battery emergency operation after a power failure, that is, to use uninterruptible power supply functions, you must also connect a battery pack.

> ⚠ **Warning**
> The UPSC-D power supply unit is only released for permanent AC power supply. Permanent operation at a direct-current system is not allowed.
> A DC power supply unit is only connected to bridge an AC power failure (emergency battery operation).
> If a 48-V direct-current system is being used instead of a battery pack for DC power supply, connection must be performed as for a battery pack. The 48-V direct-current system must not exceed the limit of 60 V in operating mode, during loading, and when an error occurs. The direct-current system must not be connected to the UPSC-D if this cannot be guaranteed.

If the power supplied by the UPSC-D is insufficient, an external EPSU2 power supply can be installed to provide additional power. For this, the EPSU2's DC connection needs to be connected to the special -48 VDC input on the UPSC-D. The UPSC-D's internal -48-V output is deactivated when the external power supply is connected.

Licensed battery pack

S30122-K5928-X (48 V (4 x 12 V)/1.2 Ah battery pack)
This is the only battery pack released for connection to UPSC-D.

> ⚠ **Danger**
> Do not use 24-V batteries (S30122-K5403-X) in conjunction with UPSC-D as an explosive gas (hydrogen + oxygen) escapes when the battery is overloaded.

Technical specifications

- Nominal voltage range: 100 VAC - 240 VAC
- Nominal frequency: 50 Hz - 60 Hz
- Ring generator: 75 VAC, 20/25/50 Hz
- Partial voltages: +5 Vdc, –48 V
- Battery charger: 4 x 12 V (40.8 V-55.2 V)
- Power consumption: 180 W
- Bridging times
  Table 3-28 lists the maximum possible bridging times (emergency battery operation in case of power failure) with battery pack S30122-K5928-X (48 V/1.2 Ah), depending on the system.

Table 3-28 UPSC-D - Bridging Times with Battery Pack S30122-K5928-X (48 V/ 1.2 Ah)

System	Power supply unit	Load levels	Maximum bridging time
HiPath 3350	UPSC-D	Normal output load = 5 V: 3 A; –48 V: 0.5 A; ringing approx. 2 VA	19 min
HiPath 3550	UPSC-D	Normal output load 100 % = 5 V: 8 A; –48 V: 1.1 A; ringing approx. 4 VA	6 min
HiPath 3550	UPSC-D	Normal output load 60 % = 5 V: 4.8 A; –48 V: 0.66 A; ringing approx. 2 VA	15 min
HiPath 3550	UPSC-D with EPSU2	Normal output load 100 % = 5 V: 8 A; –48 V: 2.5 A (external via EPSU2); ringing approx. 4 VA	17 min
Measurement conditions: ● All measurements were performed at a room temperature of approximately 23 °C (73.4°F). ● The batteries were fully charged when the measurement was started.			

Diagram of UPSC-D

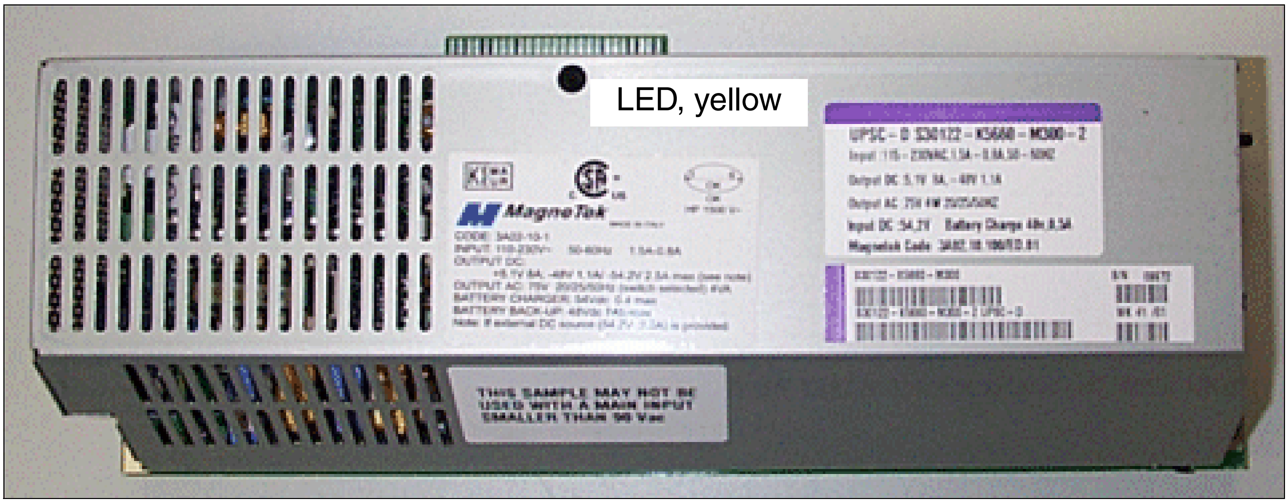

LED, yellow
THIS SAMPLE MAY NOT BE USED WITH A MAIN INPUT SMALLER THAN 90 Vac

Figure 3-25 UPSC-D (S30122-K5660-M300)

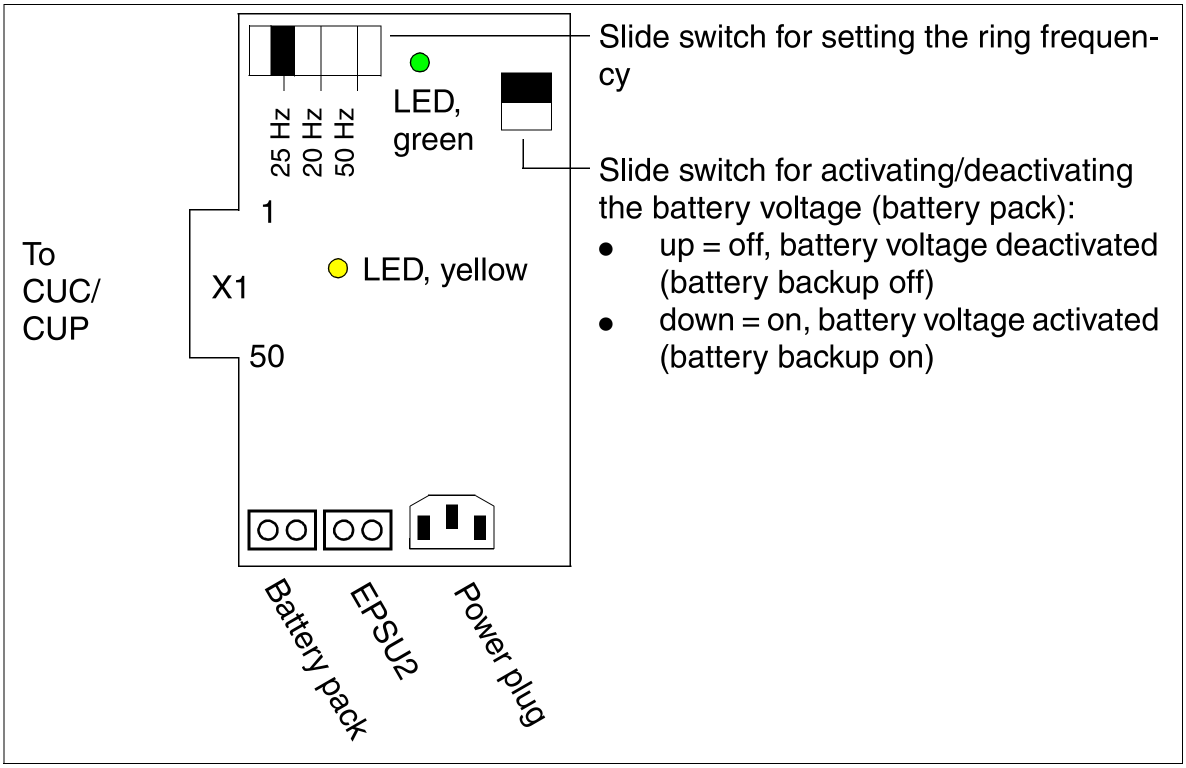
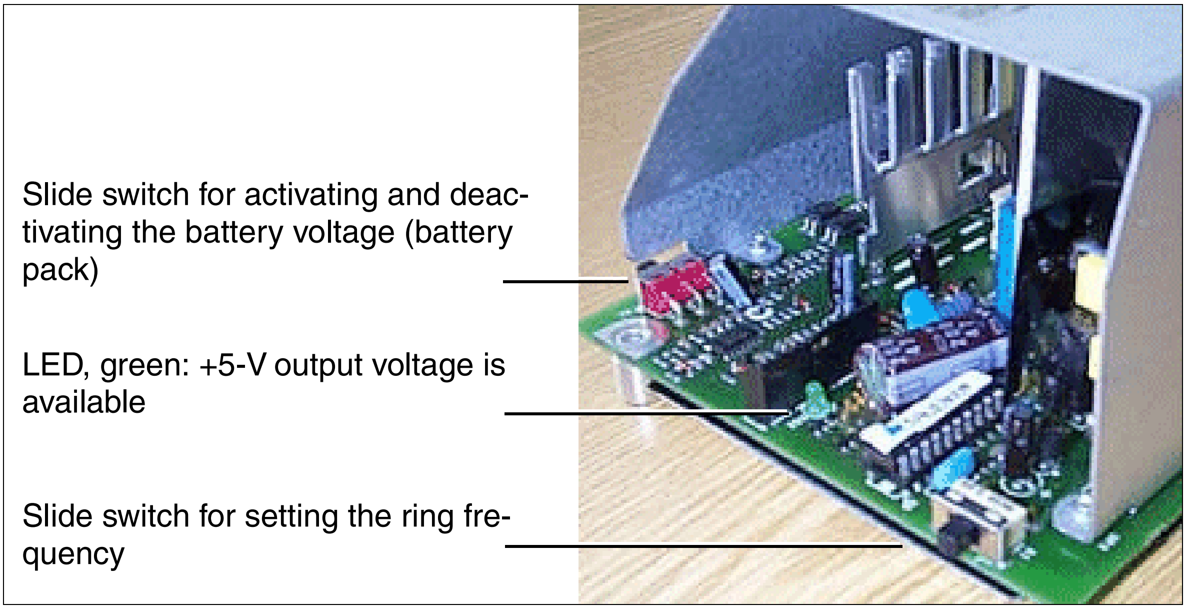

Slide switch for setting the ring frequency
25 Hz
20 Hz
50 Hz
LED, green
Slide switch for activating/deactivating the battery voltage (battery pack):
● up = off, battery voltage deactivated (battery backup off)
● down = on, battery voltage activated (battery backup on)
To CUC/ CUP
X1
1
50
LED, yellow
Battery pack
EPSU2
Power plug

Figure 3-26 UPSC-D (S30122-K5660-M300)

Switches and indicators

Caution
System voltage can only be switched on or off by plugging in or out the power plug. If using an uninterruptible power supply, switch off the battery voltage first.

- LED, green: +5-V output voltage is available.
- LED, yellow: –48-V output voltage is supplied by the external EPSU2 power supply.
- Slide switch for setting the ring frequency:
  – 25 Hz (Germany + international market)
  – 20 Hz (U.S.)
  – 50 Hz (France)
- Slide switch for activating and deactivating the battery voltage (battery pack):
  - up = off, battery voltage deactivated (battery backup off)
  - down = on, battery voltage activated (battery backup on)



Slide switch for activating and deactivating the battery voltage (battery pack)

LED, green: +5-V output voltage is available

Slide switch for setting the ring frequency

Figure 3-27 UPSC-D - Switches and LEDs

Connectors

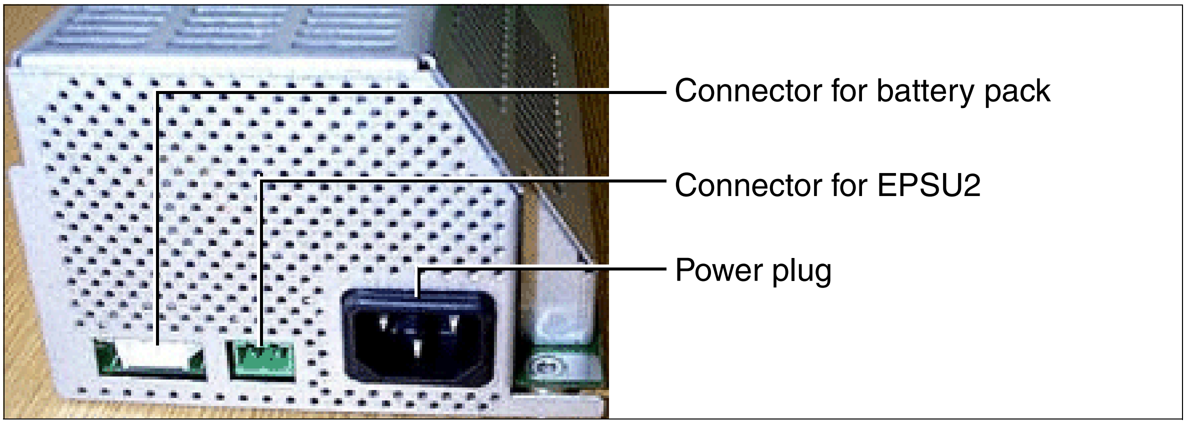

Connector for battery pack
Connector for EPSU2
Power plug

Figure 3-28 UPSC-D - Connectors

3.2.18 UPSC-DR

Introduction

The UPSC-DR S30122-K7373-M900 board (Figure 3-29) is used in HiPath 3500 and HiPath 3300 (19-inch housing).

This module supports power supply and battery management functions. No other components are required if it is operated as an AC power supply. To maintain short-term battery emergency operation after a power failure, that is, to use uninterruptible power supply functions, you must also connect a battery pack (see Section 9.2.4).

Warning
The UPSC-DR power supply unit is only released for permanent AC power supply. Permanent operation at a direct-current system is not allowed.
A DC power supply unit is only connected to bridge an AC power failure (emergency battery operation).
If a 48-V direct-current system is being used instead of a battery pack for DC power supply, connection must be performed as for a battery pack. The 48-V direct-current system must not exceed the limit of 60 V in operating mode, during loading, and when an error occurs. The direct-current system must not be connected to the UPSC-DR if this cannot be guaranteed!

Danger
The **UPSC-DR board is not insulated**.
Consequently, a system using a UPSC-DR may only be operated with a closed housing.
Before opening the housing, make sure that the system is de-energized as follows:

- by disconnecting the battery voltage and line voltage at any connected ECR (see Section 9.2.4.1, “ECR Control, Display, and Connecting Elements”).
- by disconnecting the line cord attached to any connected batteries (installed in the ECR) (see Section 9.2.4.4, “Expansion Cabinet Rack ECR With Batteries”).
- by disconnecting the line cord attached to any connected EPSU2-R (installed in the ECR) (see Section 9.2.4.5, “Expansion Cabinet Rack ECR With Batteries and EPSU2-R”).
- by disconnecting the power plug.

If the power supplied by the UPSC-DR is insufficient, an external EPSU2-R power supply can be installed to provide additional power. To do this, connect the DC port on the EPSU2-R to the special –48-Vdc input on the UPSC-DR. The UPSC-DR’s internal -48 V output is deactivated when the external power supply is connected.

Licensed batteries

4 x V39113-W5123-E891 (4 x 12 V/7 Ah batteries)
These are the only batteries released for connection to UPSC-DR and installation in ECRs.

> ⚠ **Danger**
> Do not use 24-V batteries (S30122-K5403-X) in conjunction with UPSC-DR as an explosive gas (hydrogen + oxygen) escapes when the battery is overloaded.

Technical specifications

- Nominal voltage range: 100 VAC - 240 VAC
- Nominal frequency: 50 Hz - 60 Hz
- Ring generator: 75 VAC, 20/25/50 Hz
- Partial voltages: +5 Vdc, –48 V
- Battery charger: 4 x 12 V (40.8 V-55.2 V)
- Power consumption: 180 W
- Bridging times
  Table 3-29 lists the maximum possible bridging times (emergency battery operation in case of power failure) with four batteries V39113-W5123-E891 (4 x 12 V/7 Ah batteries), depending on the system.

Table 3-29 UPSC-DR - Bridging Times with four Batteries V39113-W5123-E891 (4 x 12 V/7 Ah Batteries)

System	Power supply unit	Load levels	Maximum bridging time
HiPath 3300	UPSC-DR	Normal output load = 5 V: 3 A; –48 V: 0.5 A; ringing approx. 2 VA	7h 30min
HiPath 3500	UPSC-DR	Normal output load 100 % = 5 V: 8 A; –48 V: 1.1 A; ringing approx. 4 VA	1h 30min
HiPath 3500	UPSC-DR	Normal output load 60 % = 5 V: 4.8 A; –48 V: 0.66 A; ringing approx. 2 VA	2h 20min
HiPath 3500	UPSC-DR with EPSU2-R	Normal output load 100 % = 5 V: 8 A; –48 V: 3 A (external via EPSU2-R); ringing approx. 4 VA	1h 30min
HiPath 3500	UPSC-DR with EPSU2-R	Normal output load 60 % = 5 V: 4.8 A; –48 V: 1.8 A (external via EPSU2-R); ringing approx. 2 VA	2h 40min

Table 3-29 UPSC-DR - Bridging Times with four Batteries V39113-W5123-E891 (4 x 12 V/7 Ah Batteries)

<table>
<tr><th>System</th><th>Power supply unit</th><th>Load levels</th><th>Maximum bridging time</th></tr>
<tr><td colspan="4">Measurement conditions:
● All measurements were performed at a room temperature of approximately 23 °C (73.4 °F).
● The batteries were fully charged when the measurement was started.</td></tr>
</table>

Diagram of UPSC-DR

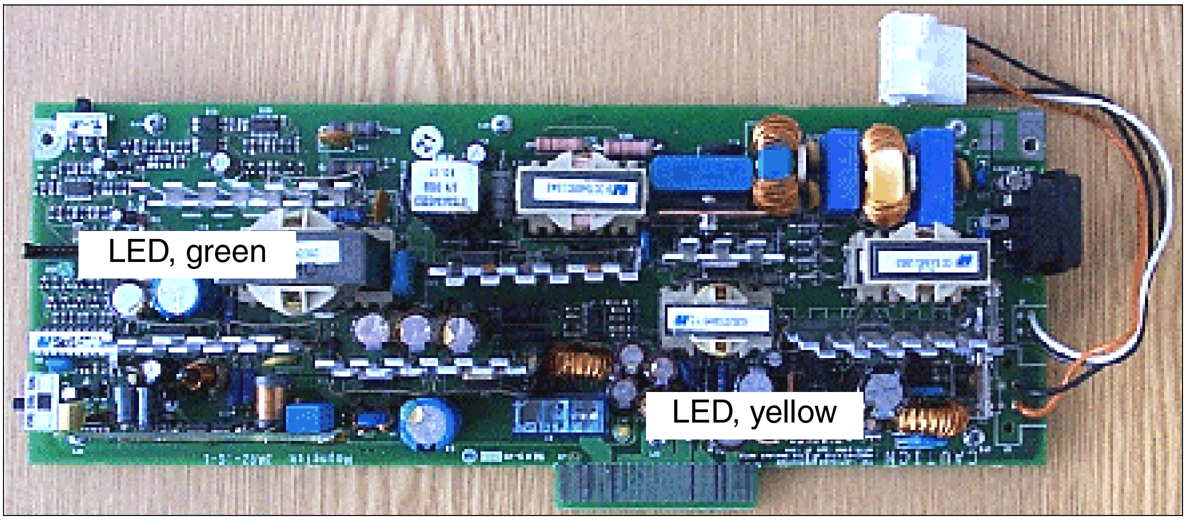


Figure 3-29 UPSC-DR (S30122-K7373-M900)

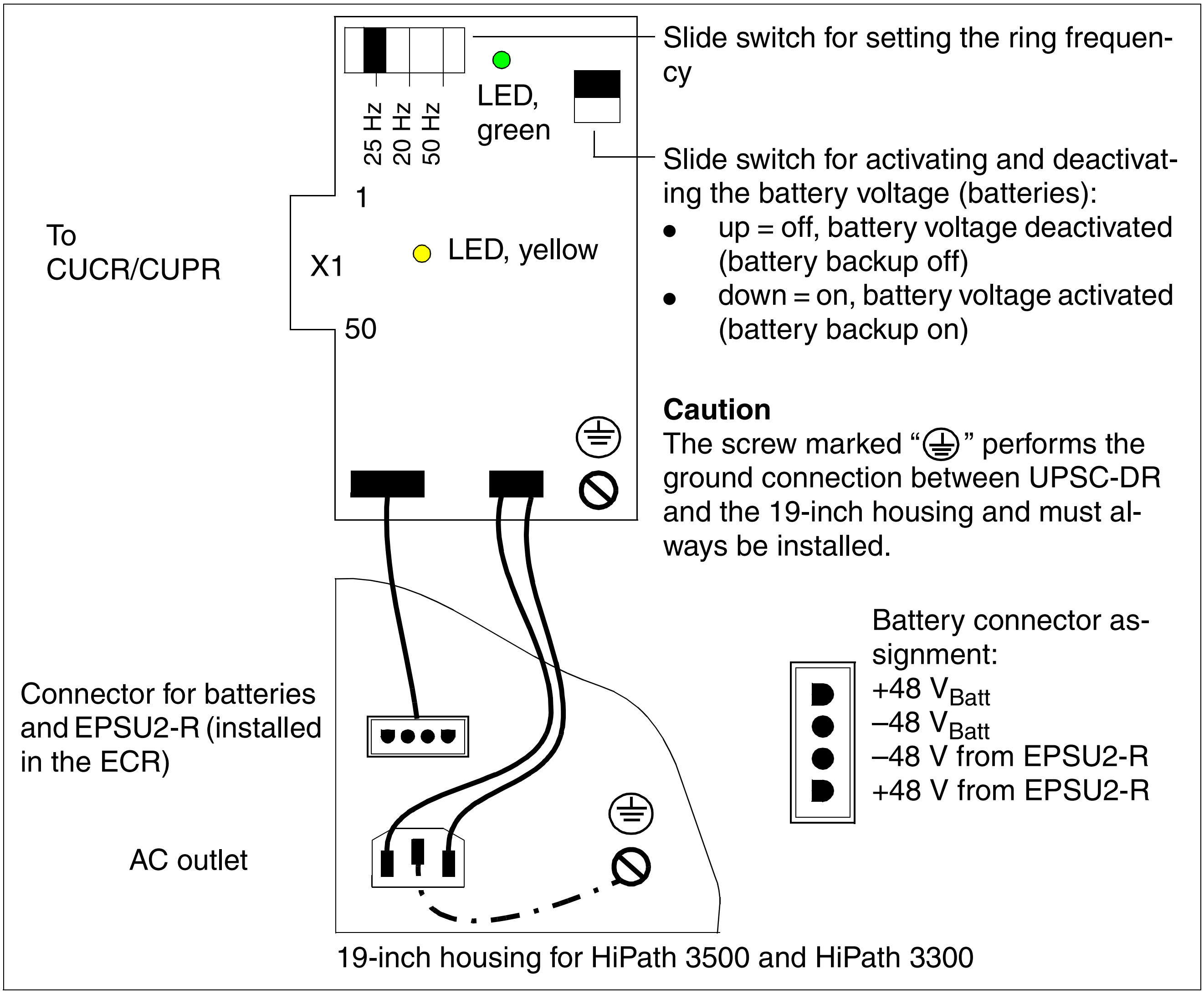

Slide switch for setting the ring frequency
25 Hz
20 Hz
50 Hz
LED, green
Slide switch for activating and deactivating the battery voltage (batteries):
• up = off, battery voltage deactivated (battery backup off)
• down = on, battery voltage activated (battery backup on)
1
To CUCR/CUPR
X1
LED, yellow
50
Caution
The screw marked “⏚” performs the ground connection between UPSC-DR and the 19-inch housing and must always be installed.
Battery connector assignment:
+48 V_{Batt}
–48 V_{Batt}
–48 V from EPSU2-R
+48 V from EPSU2-R
Connector for batteries and EPSU2-R (installed in the ECR)
AC outlet
19-inch housing for HiPath 3500 and HiPath 3300

Figure 3-30 UPSC-DR (S30122-K7373-M900)

Switches and indicators

> ⚠ **Caution**
> System voltage can only be switched on or off by plugging in or out the power plug.
> If using an uninterruptible power supply, switch off the battery voltage first.

- LED, green: +5-V output voltage is available.
- LED, yellow: –48-V output voltage is supplied by the external EPSU2-R power supply.
- Slide switch for setting the ring frequency:
  – 25 Hz (Germany + international market)
  – 20 Hz (U.S.)
  – 50 Hz (France)
- Slide switch for activating and deactivating the battery voltage (batteries):
  - up = off, battery voltage deactivated (battery backup off)
  - down = on, battery voltage activated (battery backup on)

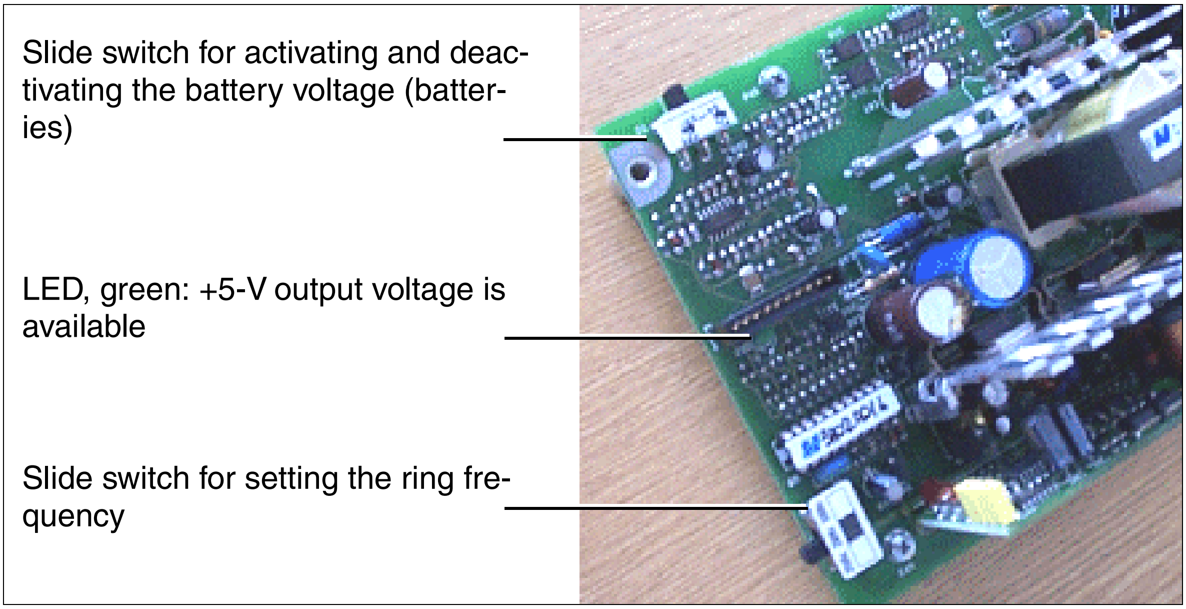

Slide switch for activating and deactivating the battery voltage (batteries)
LED, green: +5-V output voltage is available
Slide switch for setting the ring frequency

Figure 3-31 UPSC-DR - Switches and LEDs

Connectors

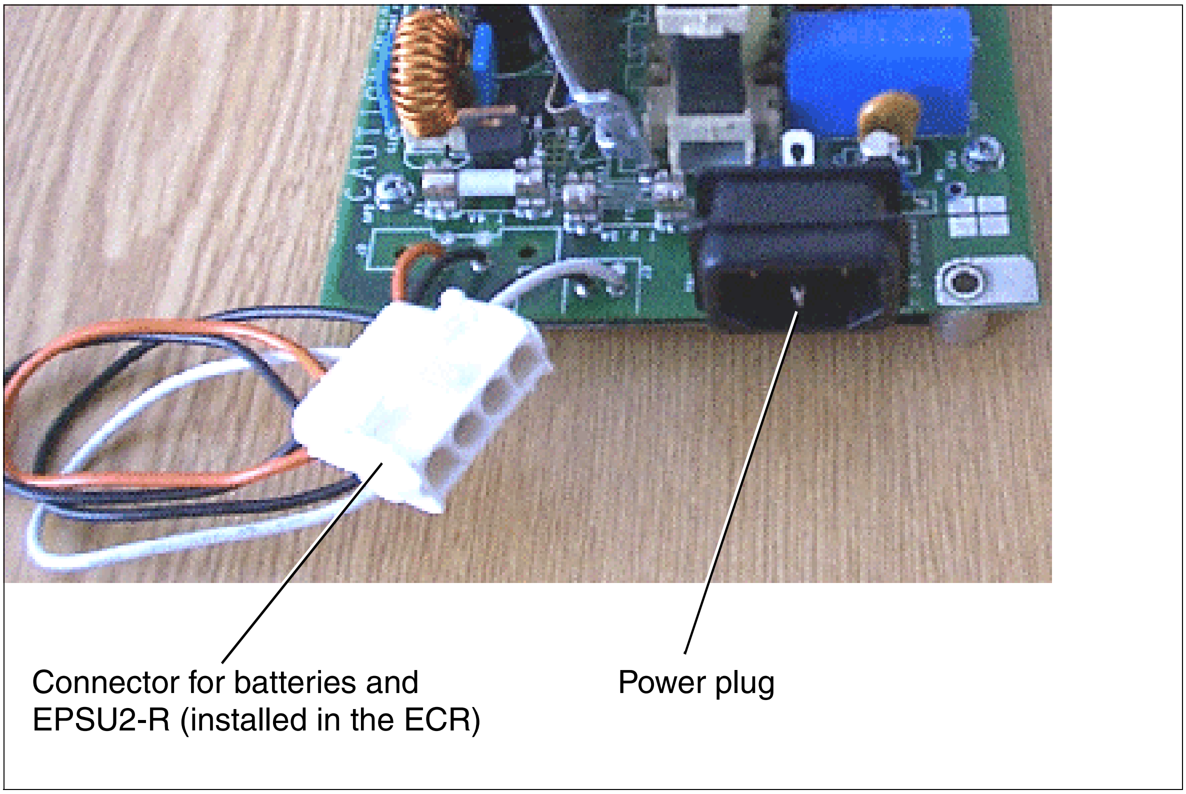

Connector for batteries and EPSU2-R (installed in the ECR)
Power plug

Figure 3-32 UPSC-DR - Connectors

3.2.19 UPSM

Introduction

Each cabinet in HiPath 3750 and HiPath 3700 requires one UPSM (**U**ninterruptible **P**ower **S**upply **M**odular). This board supports power supply and battery management functions. No other components are required if operated as an AC power supply. To maintain short-term battery emergency operation after a power failure, that is, to use uninterruptible power supply functions, you must also connect a battery pack per system cabinet or a BSG 48/38 battery cabinet (including battery charger) to the UPSM.

⚠ **Warning**
The UPSM power supply is only released for permanent AC power supply. Permanent operation at a direct-current system is not allowed.
A DC power supply unit is only connected to bridge an AC power failure (emergency battery operation).
If a 48-V direct-current system is being used instead of a battery pack for DC power supply, connection must be performed as for a battery pack. The 48-V direct-current system must not exceed the limit of 60 V in operating mode, during loading, and when an error occurs. The direct-current system must not be connected to the UPSM if this cannot be guaranteed!

ℹ Each connection must have a ferrite bead provided between the UPSM and battery pack, battery cabinet or 48-V direct-current system. Insert the ferrite bead (Würth 742 7113 or C39022-Z7000-C7) with two windings into the connection cable at the UPSM output.
You do not need a ferrite assembly when using the BSG 48/38 battery cabinet in version 2 or later as the ferrite beads were integrated in the battery cabinet.

UPSM/PSUI mixed mode is only permitted in a system if the UPSM is operated without additional 48 V DC connection, that is in 110/220 V AC mode only.
Due to battery connection differences, mixed mode is not permitted in systems with uninterruptible power supply USVI. UPSM must not be implemented in these systems.

The UPSM is used in all countries. The ring frequency of the modular ring generator can be parameterized to suit country-specific requirements. For production-related reasons there are two different UPSM models. Technically identical, the two models have minor mechanical differences and are fully compatible with each other.
The only exception is the UPSM model S30122-K5950-S121 which supplies a ring voltage of 60 V_{eff} and is only implemented in the Republic of South Africa (RSA).

For U.S. only:
The UPSM can be installed in the following cabinets:

- BC
- Expansion cabinet 1: S30777-U709-X
- Expansion cabinet 2: S30777-U709-X100

The UPSM can also be installed on new backplanes with re-oriented CHAMP connectors. Uninterruptible power supply functions in the form of a UPSM are not used in the U.S.

Caution
When mounting the UPSM on the cabinet frame, be careful to prevent screws from falling into the power supply unit through the ring generator opening.
If a screw falls inside the UPSM, remove the screw before starting up the unit.

LEDs and switches

An LED lights up to indicate that the UPSM is in operation. The UPSM must be replaced when defective (LED does not light up).

Caution
The switches for deactivating the secondary operating voltage (system supply voltage) must be set to “Off” on all UPSMs during maintenance work that requires the system to be de-energized (for example, central board replacement).

Part numbers

- UPSM: S30122-K5950-S100 (Figure 3-33), S30122-K5950-A100 (Figure 3-34), S30122-K5959-S121 (for RSA only)
- Battery pack 4 x 12 V/7 Ah: S30122-K5950-Y200
  (The connection cable for the UPSM is part of the battery pack.)
- Battery cabinet BSG 48/38: S30122-K5950-F300 (Page 3-84)
  - Battery cable for BSG 48/38: S30122-X5950-F310
    (One battery cable is required for each system cabinet (UPSM) to be connected.)
  - Battery 12 V/38 Ah: S30122-X5950-F320
    (Four batteries necessary for each BSG 48/38.)

Technical Specifications

- Nominal voltage range: 100 VAC - 240 VAC
- Nominal frequency: 50 Hz - 60 Hz
- Max. input current consumption: 5.4 A - 2.7 A
- Max. power consumption: around 430 W
- Output voltage (battery charging voltage): 42.5 - 55.2 VDC
- Output current (battery charge current): ≥ 0.8 A
  (sufficient for battery set rating) = 7 Ah)
- Bridging times
  Table 3-30 lists the maximum possible bridging times (emergency battery operation in case of power failure) with battery pack S30122-K5950-Y200 (48 V/7 Ah).

Table 3-30 UPSM - Bridging Times with Battery Pack S30122-K5950-Y200 (48 V/7 Ah)

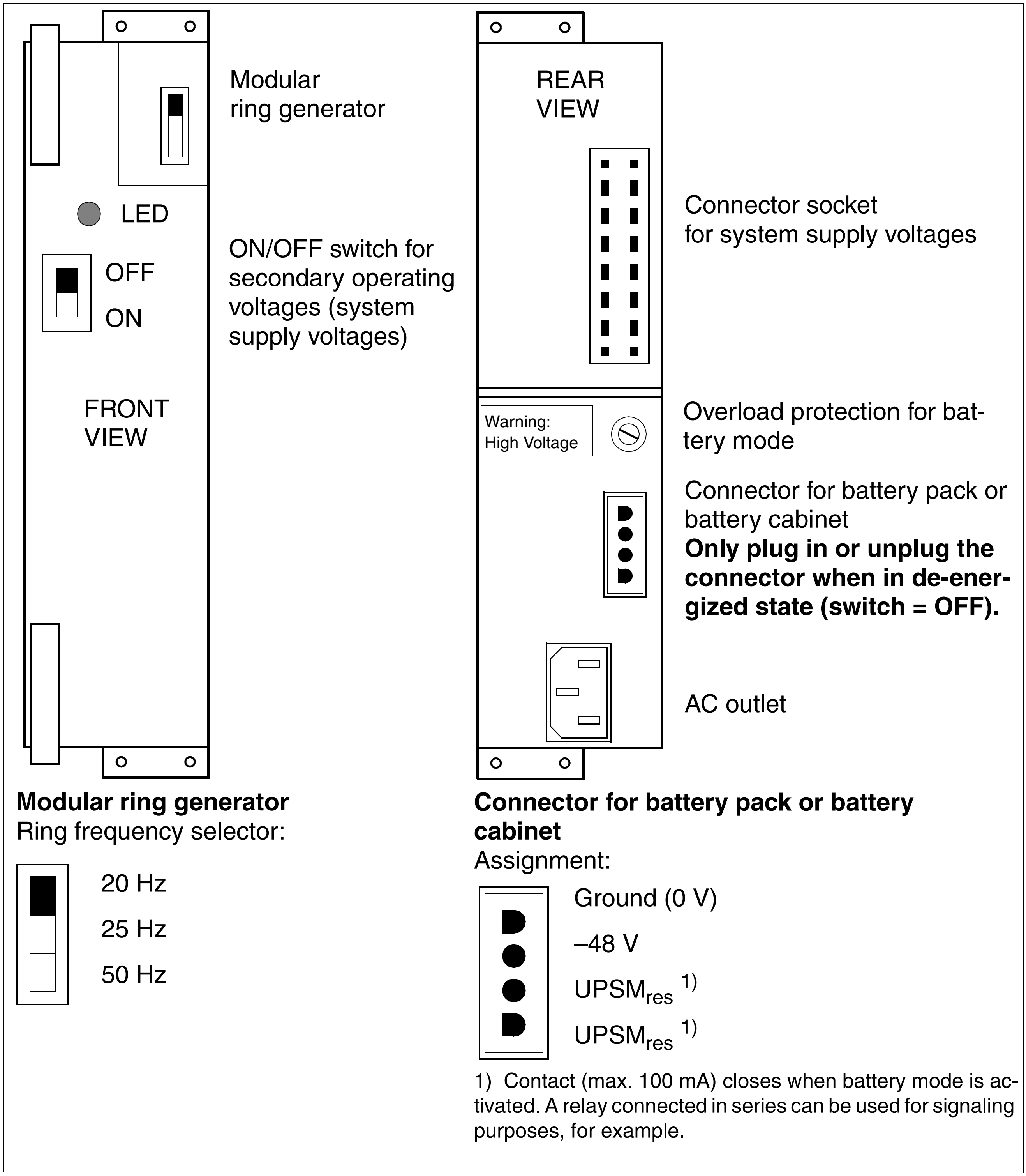
System	Power supply unit	Load levels	Maximum bridging time
HiPath 3750 HiPath 3700	UPSM	100 % nominal load	1h
HiPath 3750 HiPath 3700	UPSM	60 % nominal load	1h 40min
Measurement conditions: ● All measurements were performed at a room temperature of approximately 22 °C (71.6 °F). ● The cut-off voltage is 1.7 V per cell ● The batteries were new and fully charged when measurement started.			

The battery recharging time is approx. 8.5 h.

Specifications of the modular ring generator

- Rated output voltages: 75 V_{act} (60 V_{eff} in UPSM model for RSA)
- Output frequencies: 20/25/50 Hz
- Output power
  - continuous: 4.0 VA
  - peak: 8.0 VA temporary (3 min. load/15 min. break)

Front and rear views of the UPSM (S30122-K5950-S100)

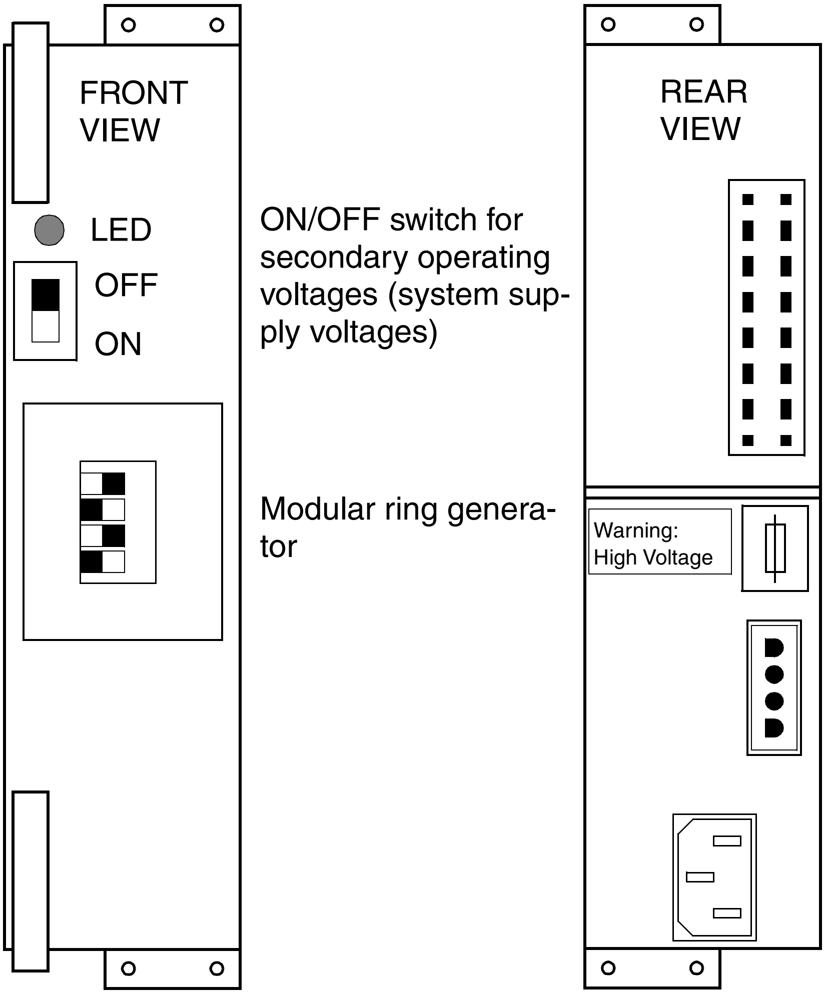

Modular ring generator
LED
OFF
ON
ON/OFF switch for secondary operating voltages (system supply voltages)
FRONT VIEW
REAR VIEW
Connector socket for system supply voltages
Warning: High Voltage
Overload protection for battery mode
Connector for battery pack or battery cabinet
AC outlet
Modular ring generator
Ring frequency selector:
20 Hz
25 Hz
50 Hz
Connector for battery pack or battery cabinet
Assignment:
Ground (0 V)
–48 V
UPSM$_{res}$ 1)
UPSM$_{res}$ 1)

Only plug in or unplug the connector when in de-energized state (switch = OFF).

1) Contact (max. 100 mA) closes when battery mode is activated. A relay connected in series can be used for signaling purposes, for example.

Figure 3-33 Front and Rear Views of the UPSM (S30122-K5950-S100)

Front and rear views of the UPSM (S30122-K5950-A100)



ON/OFF switch for secondary operating voltages (system supply voltages)

Modular ring generator

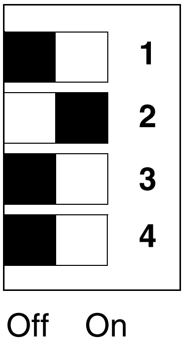
Connector for system supply voltages

Overload protection for battery mode

Connector for battery pack or battery cabinet
Only plug in or unplug the connector when in de-energized state (switch = OFF).

AC outlet

Modular ring generator
Ring frequency selector:



DIP switches (for example 25 Hz)

DIP switch settings

1	2	3	4	Frequency
On	Off	Off		20 Hz
Off	On	Off		25 Hz
Off	Off	On		50 Hz

(S4 = used for factory testing)

Figure 3-34 Front and Rear Views of the UPSM (S30122-K5950-A100)

BSG 48/38

You can use a BSG 48/38 battery cabinet instead of a battery pack to extend the bridging time in the event of a power failure. The BSG 48/38 battery cabinet (S30122-K5950-F300) consists of

- an upright housing
- a charging rectifier
- a battery set (38 Ah/48 V)

The battery cabinet is designed for direct connection to the HiPath 3750 and HiPath 3700 communication system. The DC power cable (S30122-X5950-F310) provided lets you connect any UPSM to the battery cabinet (do not connect to extension cables). A schematic diagram shows the connections between the BSG 48/38 battery cabinet and the communication system (UPSM) Figure 3-36.

> For detailed information about safety precautions as well as using and connecting the battery cabinet, refer to the installation and startup instructions that came with the cabinet.

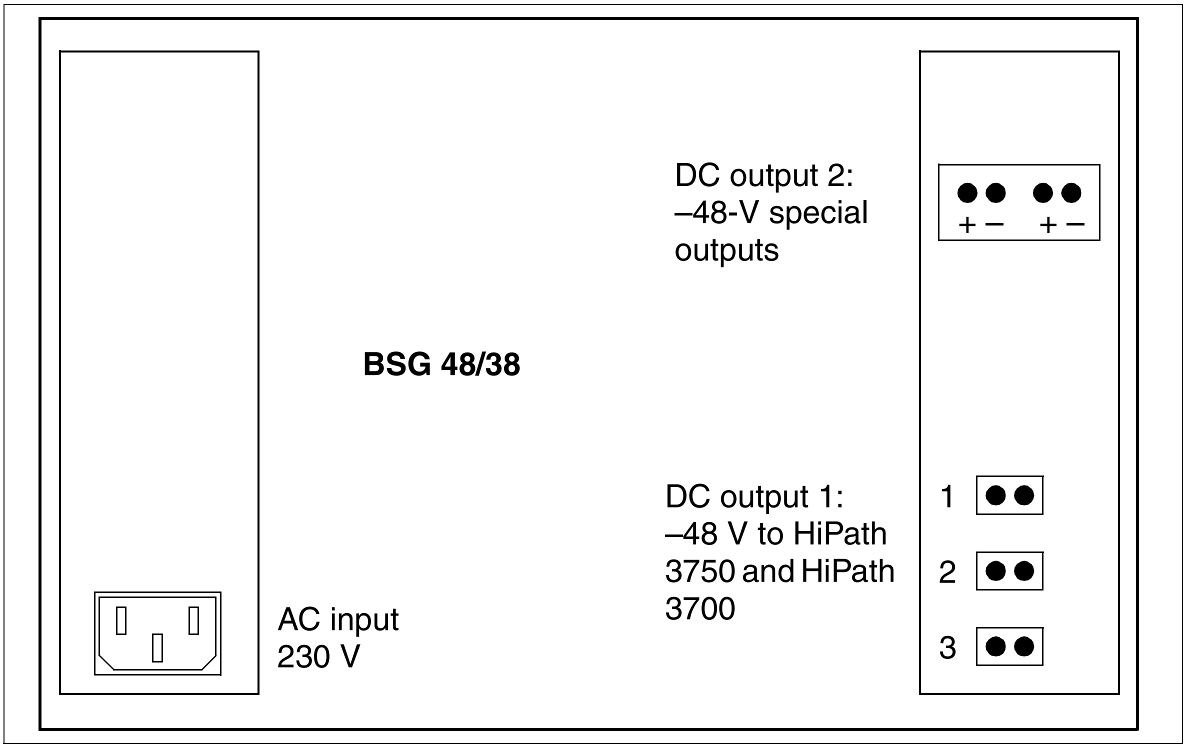
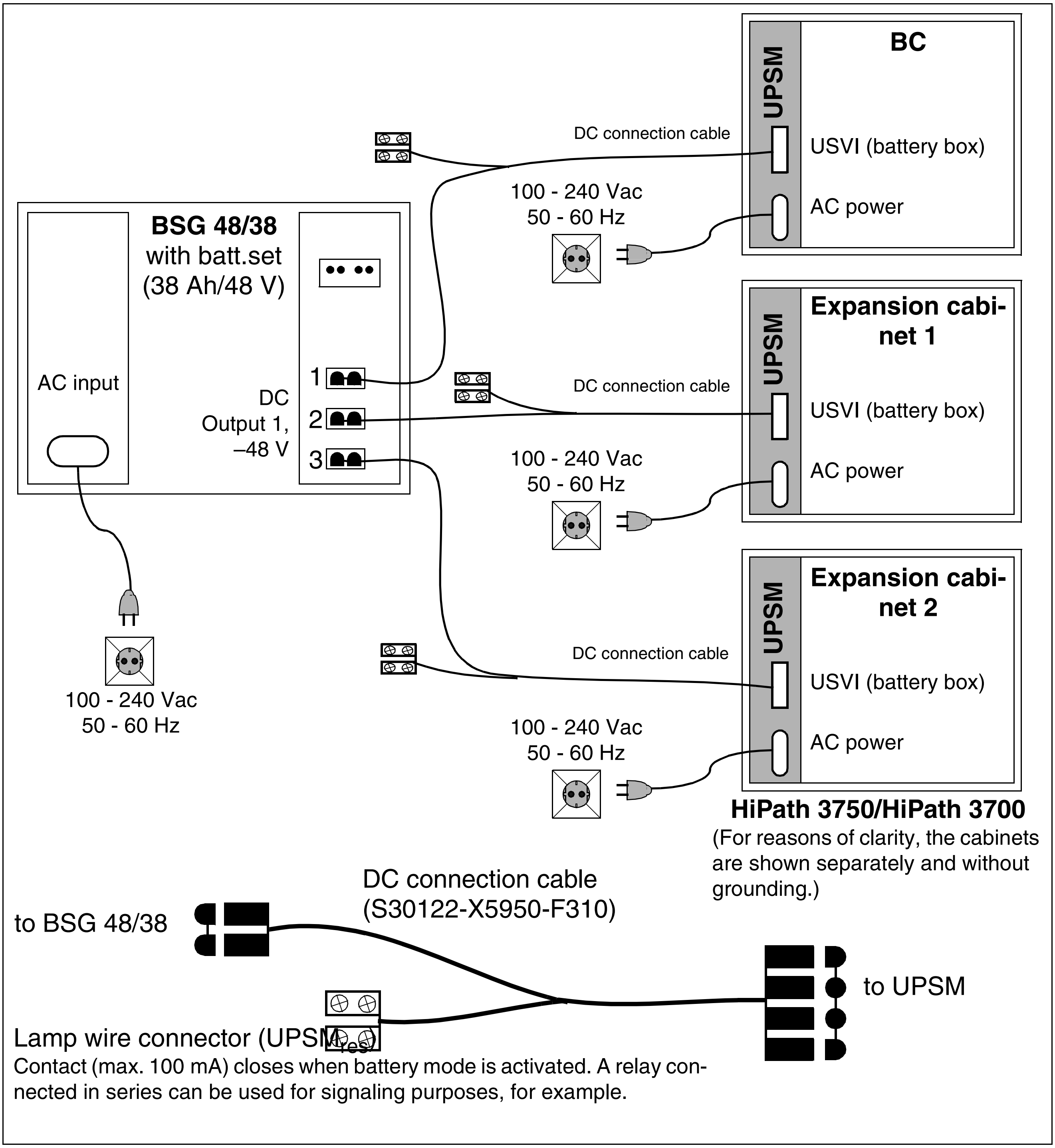


Figure 3-35 Rear View of the BSG 48/38 Battery Cabinet (S30122-K5950-F300)


BC
UPSM
USVI (battery box)
AC power
DC connection cable
100 - 240 Vac
50 - 60 Hz
BSG 48/38
with batt.set
(38 Ah/48 V)
AC input
DC
Output 1,
–48 V
1
2
3
Expansion cabi-net 1
UPSM
USVI (battery box)
AC power
DC connection cable
100 - 240 Vac
50 - 60 Hz
Expansion cabi-net 2
UPSM
USVI (battery box)
AC power
DC connection cable
100 - 240 Vac
50 - 60 Hz
100 - 240 Vac
50 - 60 Hz
HiPath 3750/HiPath 3700
DC connection cable
(S30122-X5950-F310)
to BSG 48/38
to UPSM
Lamp wire connector (UPSM$_{res}$)

(For reasons of clarity, the cabinets are shown separately and without grounding.)

Contact (max. 100 mA) closes when battery mode is activated. A relay connected in series can be used for signaling purposes, for example.

Figure 3-36 Connections between the BSG 48/38 Battery Cabinet and UPSM (HiPath 3750, HiPath 3700)

3.3 Peripheral Boards

> **Caution**
> The system must be powered down and de-energized before removing or inserting **all boards** in the HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300 and before removing or inserting the **central boards** of the HiPath 3800, HiPath 3750 and HiPath 3700.

Note

The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.

3.3.1 DIU2U (For U.S. Only)

Introduction

The DIU2U (**D**igital **I**nterface **U**nit **2** **U**niversal) trunk module connects two digital trunks to HiPath 3800 and in this way provides two primary rate interfaces (PRI) ISDN via T1 interfaces.

Connection types

- Fiber optic cable
  The fiber optic cable is only connected via the front panel. The opto-electronic converter AMOM must be used to connect a fiber optic cable to the 15-pin Sub-D jacks on the front panel.
- Copper cable
  The copper cable is connected to T1-CSU (Customer Service Unit) or DSU (Data Service Unit) via the adapter cable (C39195-A7269-B625) shown in Figure 3-37.

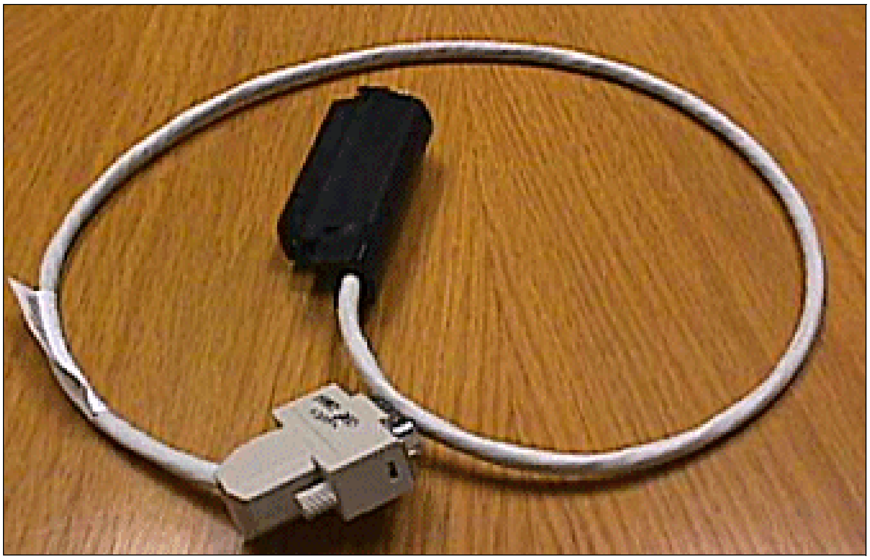
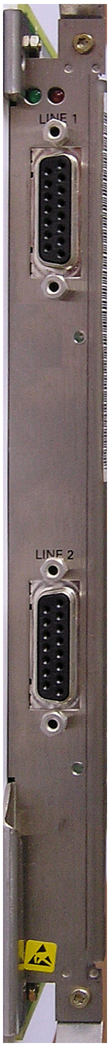


Figure 3-37 DIU2U Adapter Cable C39195-A7269-B625 (for U.S. only)

Front panel



Two LEDs indicating the board status:

- LED (green)
- LED (red)

Interface 1

Interface 2

Figure 3-38 DIU2U (for U.S. only) - Front Panel (S30810-Q2216-X)

LED statuses and their meanings

Table 3-31 DIU2U (For U.S. Only) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one channel is activated.	

3.3.2 DIUN2

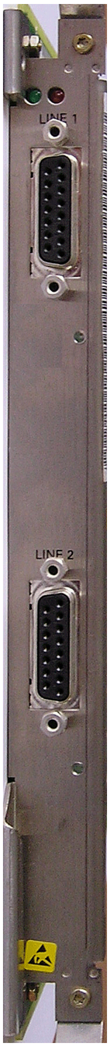
Introduction

The DIUN2 (**D**igital **I**nterface **U**nit ISD**N**) provides 2 x 30 B channels (voice channels) for HiPath 3800. These are used

- for the S_{2M} trunk connection (via NT).
- for S_{2M} networking via S_{2M} lines.

> In HiPath 3000/5000 V5.0 and later, the B channels in the DIUN2 board are subject to license. Information on licensing can be found in Chapter 8.

Front panel



Two LEDs indicating the board status:

- LED (green)
- LED (red)

Interface 1

Interface 2

Figure 3-39 DIUN2 - Front Panel (S30810-Q2196-X)

LED statuses and their meanings

Table 3-32 DIUN2 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one channel is activated.	

Connection types

- Fiber optic cable
  The fiber optic cable is only connected via the front panel. The opto-electronic converter AMOM must be used to connect a fiber optic cable to the 15-pin Sub-D jacks on the front panel.
- Copper cable
  The copper cable is only connected via the 15-pin Sub-D jacks on the front panel.

Jack assignment

Table 3-33 DIUN2 - 15-Pin Sub-D Jack Assignment

Pin	Signal	Signal description	Route
1	TTIP0	a-wire 120 ohms/75 ohms	Output
4	LWLO0_FRONT	Fiber optic (data output)	Output
5	GND	Ground return path for the +5-V power supply	Input/output
6	SCAN_IN0	Adapter test	Input
7	SCAN_IN0	Adapter test	Input
8	RTIP0	a-wire 120 ohms/75 ohms	Input
9	TRING0	b-wire 120 ohms/75 ohms	Output
10	+5 V	+5-V power supply	Output
11	LWLI0_FRONT	Fibre optic (data input)	Input
12	GND	Ground return path for the +5-V power supply	Input/output
14	+5 V	+5-V power supply	Output
15	RRING0	b-wire 120 ohms/75 ohms	Input
No other pins used.			

Assigning the system cable S30267-Z167-Axxx

Table 3-34 DIUN2 - Assigning the System Cable S30267-Z167-Axxx

Pin	Function	Color code
8	a-wire (T), receive	ora/wht
15	b-wire (R), receive	wht/ora
1	a-wire (T), transmit	blu/wht
9	b-wire (R), transmit	wht/blu

3.3.3 HXGM3

Introduction

HXGM3 is a VoIP gateway board (VoIP - Voice over IP) which provides the functionality of HG 1500 in HiPath 3750 and HiPath 3700:

- Connection of a local LAN to the HiPath 3000 and connection with external LANs via the ISDN and DSL interfaces of HiPath 3000.
- Support for the conventional functions of an ISDN and DSL router with the additional functionality of a media gateway for the transfer of voice, fax and data.
- Forwarding of calls between IP-supported networks (LAN, intranet, Internet) and circuit-switched networks (ISDN, PSTN).

Configuration is performed via Web-based management (WBM) which enables the administration of HG 1500 without any special software requirements.

A combination of up to eight HXGM3 boards can be used per system, but the following restrictions must be observed:

- A maximum of four HXGM3 boards may be inserted per HiPath 3750 or HiPath 3700 cabinet.
- To allow for future channel expansion with extension modules, the slot between two HXGM3 boards should remain free.
- It is not possible to operate an HXGM3 and an LIM module simultaneously in a HiPath 3750 or HiPath 3700.

For information on configuration, refer to the HG 1500 Administration Manual.

For information on how to calculate the number of boards required for HG 1500, see Section 10.6.4.

Board versions

Table 3-35 HXGM3 Board Versions

Board	Part number	Services	DSPs	B channels DSP channels
HXGM3	S30810-Q2942-X	Voice and Data	2	16

Eight simultaneous Voice over IP connections are possible per DSP (Digital Signal Processor).

Extension modules

The HXGM3 board has three HGA (HiPath Gateway Accelerator) slots, which can be used to connect the extension modules.

Table 3-36 HXGM3 Extension Modules

Extension module	Part number	Function	Notes
PDM1 (PMC DSP modules)	S30807-Q5692-X100	Used for expansion for an additional eight DSP channels.	• Up to two PDM1 modules per HXGM3. • Installed at HGA slots 0 and 2 only.

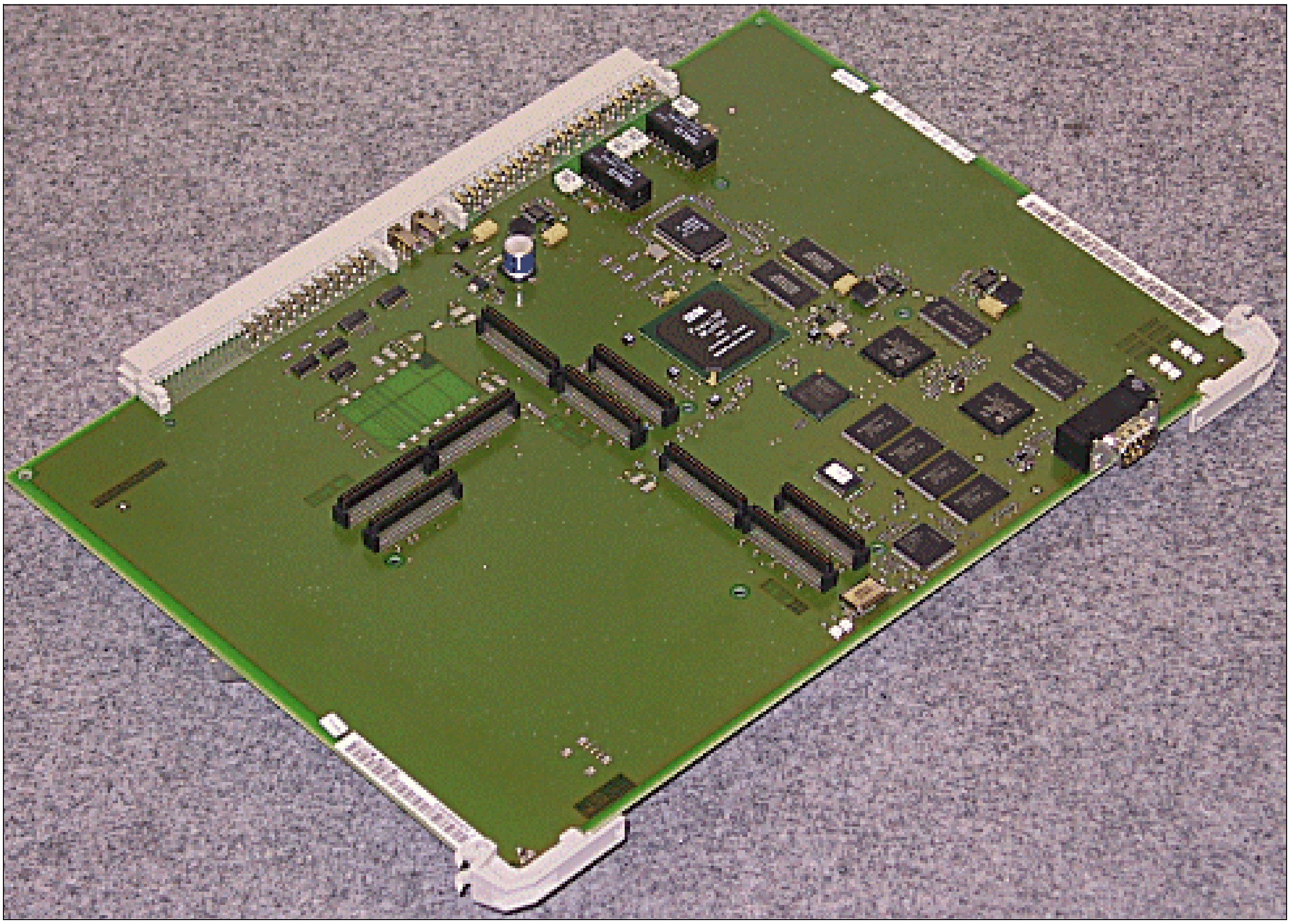


Figure 3-40 HXGM3 (S30810-Q2942-X)

Interfaces/connectors

The HXGM3 board provides the following connectors:

- X10: 9-pin Sub-D plug for V.24 interface
- Backplane: The LAN adapter connector C39228-A7195-A10 (see Figure 3-42) is inserted directly on the backplane connector SU Xx8 or SU Xx9 for a LAN connection. The LAN cable is connected via the RJ45 socket of the adapter.

  For U.S. only: The LAN connection is made using a special adapter cable (CHAMP in accordance with RJ45) (see Figure 3-43).

  Both LAN interfaces allow access to the Ethernet standard (IEEE 802.3) with 10 Mbps or 100 Mbps with automatic configuration. Manual configuration is also possible.

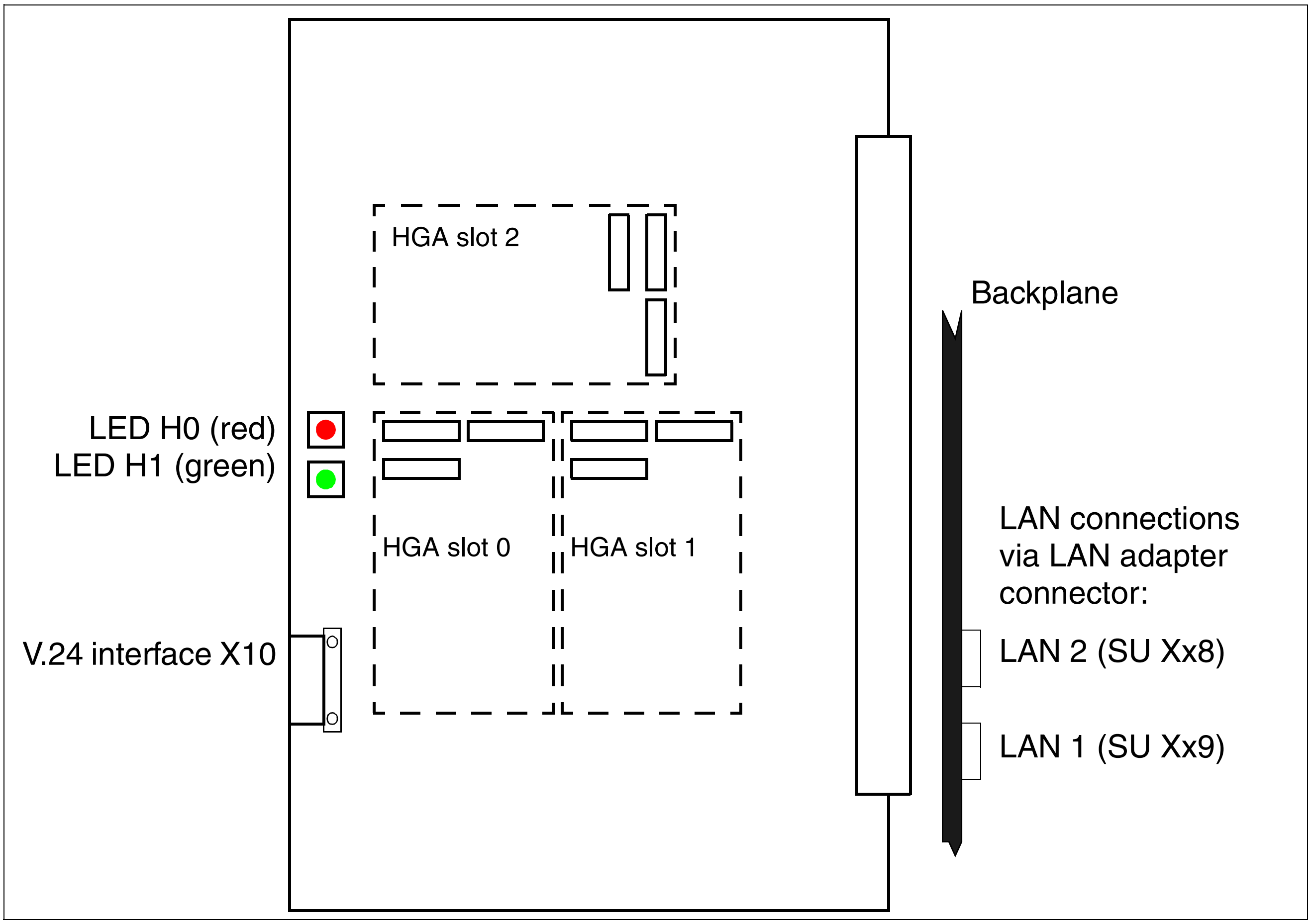

HGA slot 2
Backplane
LED H0 (red)
LED H1 (green)
HGA slot 0
HGA slot 1
LAN connections via LAN adapter connector:
V.24 interface X10
LAN 2 (SU Xx8)
LAN 1 (SU Xx9)

Figure 3-41 HXGM3 - Interfaces

LED statuses and their meanings

Table 3-37 HXGM3 - LED Concept

LED		Meaning
H1 - green	Off	Board is active but there are no active calls.
	On	At least one call is active.
H0 - red	On	Error
	Flashing	Start (after a restart)

V.24 interface

The V.24 cable (C30267-Z355-A25) is used for connecting the service PC.

The following settings must be chosen for a terminal or PC connected to the V.24 interface:

Transmission rate	19,200
Data bits	8
Parity bit	None
Stop bits	1
Data flow control	None

It is recommended that the local echo be deactivated on the connected terminal or PC.

Table 3-38 HXGM3 - Assignment of V.24 Interface X10

Pin	Signal	I/O	Remark
1			
2	RxD	I	Internal pull-up resistor in level switch (MAX211E)
3	TxD	O	
4	DTR	O	
5	0 V		Ground
6	DSR	I	Internal pull-up resistor in level switch (MAX211E)
7	RTS	O	
8	CTS	I	Internal pull-up resistor in level switch (MAX211E)
9			

LAN adapter connector

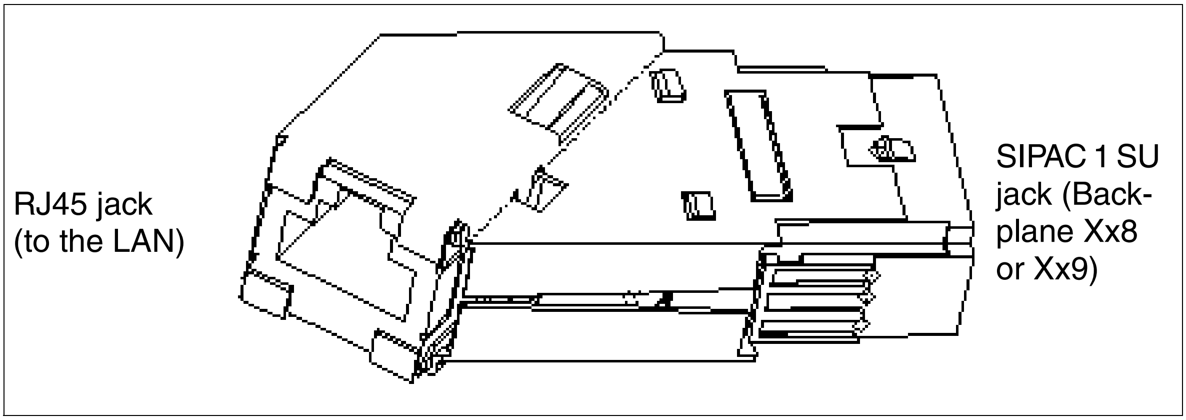


Figure 3-42 HXGM3 LAN Adapter Connector for Backplane

Table 3-39 HXGM3 LAN Adapter Connector Assignment

SIPAC 1 SU jack	RJ45 jack	Signal
B1	1	TDP (Transmit Data +)
C2	2	TDN (Transmit Data –)
B3	4	TT1 (Transmit Termination 1)
C4	5	TT2 (Transmit Termination 2)
B5	3	RDP (Receive Data +)
C6	6	RDN (Receive Data –)
B7	7	RT1 (Receive Termination 1)
C8	8	RT2 (Receive Termination 2)
Signals TT1/2 and RT1/2 are not needed for transmitting data. They represent a signal termination of 100 ohms (so-called Bob Smith termination) for the two unused wire pairs in a 4-pair twisted pair cable.		

LAN adapter cable (for U.S. only)

The LAN connection is made with a special shielded adapter cable (CHAMP after the RJ45).

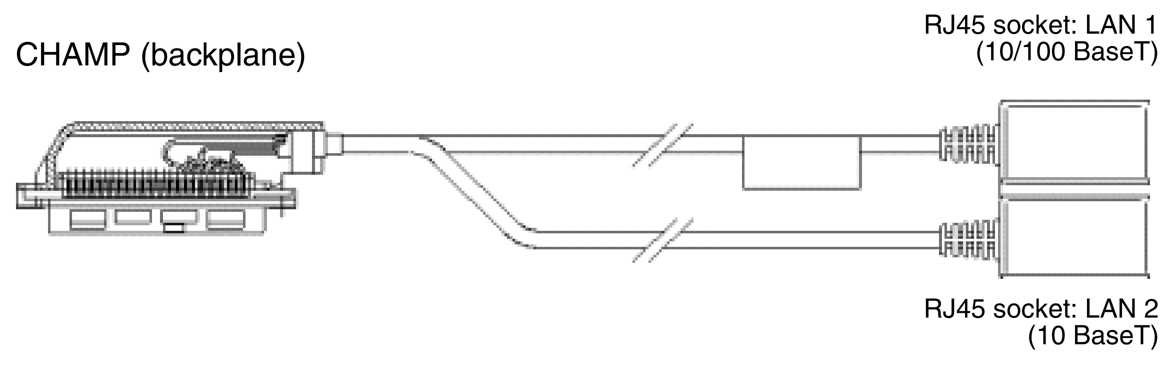


Figure 3-43 HXGM3 LAN Adapter Cable for Backplane (for U.S. only)

Table 3-40 HXGM3 - LAN Adapter Cable Assignment (for U.S. only)

CHAMP connector	RJ45 jack	Signal	LAN connection
34	1	TDP (Transmit Data +)	LAN 2
35	2	TDN (Transmit Data –)	
36	4	TT1 (Transmit Termination 1)	
37	5	TT2 (Transmit Termination 2)	
38	3	RDP (Receive Data +)	
39	6	RDN (Receive Data –)	
40	7	RT1 (Receive Termination 1)	
41	8	RT2 (Receive Termination 2)	
42	1	TDP (Transmit Data +)	LAN 1
43	2	TDN (Transmit Data –)	
44	4	TT1 (Transmit Termination 1)	
45	5	TT2 (Transmit Termination 2)	
46	3	RDP (Receive Data +)	
47	6	RDN (Receive Data –)	
48	7	RT1 (Receive Termination 1)	
49	8	RT2 (Receive Termination 2)	
25, 50	Housing	Shield	

3.3.4 HXGS3, HXGR3

Introduction

HXGS3 and HXGR3 are VoIP gateway boards (VoIP - Voice over IP), which provide the functionality of HG 1500 in HiPath 3550, HiPath 3350 (HXGS3) and HiPath 3500, HiPath 3300 (HXGR3):

- Connection of a local LAN to the HiPath 3000 and connection with external LANs via the ISDN and DSL interfaces of HiPath 3000.
- Support for the conventional functions of an ISDN and DSL router with the additional functionality of a media gateway for the transfer of voice, fax and data.
- Forwarding of calls between IP-supported networks (LAN, intranet, Internet) and circuit-switched networks (ISDN, PSTN).

Configuration is performed via Web-based management (WBM) which enables the administration of HG 1500 without any special software requirements.

> Up to three boards can be used in HiPath 3550 and HiPath 3500. To support this maximum configuration, slot 10 (board in HiPath 3750 format) must remain free.
> A maximum of one board is permitted in HiPath 3350 and HiPath 3300. Two HG 1500 boards can be installed if PDM1 is not being used.
> When using an HXGS3 in HiPath 3350, the lower supply unit PSUP must be replaced with UPSC-D.
> It is not possible to operate an HXGS3 or HXGR3 and an LIM module simultaneously in one system.
> For information on configuration, refer to the HG 1500 Administration Manual.

> **Caution**
> When using an HXGS3 board in a HiPath 3550 or HiPath 3350, fan kit C39165-A7021-D3 must be installed for thermal reasons (see Page 3-106).

For information on how to calculate the number of boards required for HG 1500, see Section 10.6.4.

Board versions

Table 3-41 HXGS3/HXGR3 Board Versions

Board	Part number	Services	DSPs	B channels DSP channels
HXGS3	S30810-Q2943-X	Voice and Data	1	8
HXGR3	S30810-K2943-Z	Voice and Data	1	8

Eight simultaneous Voice over IP connections are possible per DSP (Digital Signal Processor).

When using the extension module PDM1, the number of DSP channels for HXGS3 and HXGR3 boards can be expanded by eight per board.

Extension modules

The HXGS3 and HXGR3 boards each have two HGA (HiPath Gateway Accelerator) slots, which can be used to connect extension modules.

Table 3-42 HXGS3/HXGR3 - Extension Modules

Extension module	Part number	Function	Notes
PDM1 (PMC DSP modules)	S30807-Q5692-X100	Used for expansion for an additional eight DSP channels.	Maximum of one PDM1 module possible.

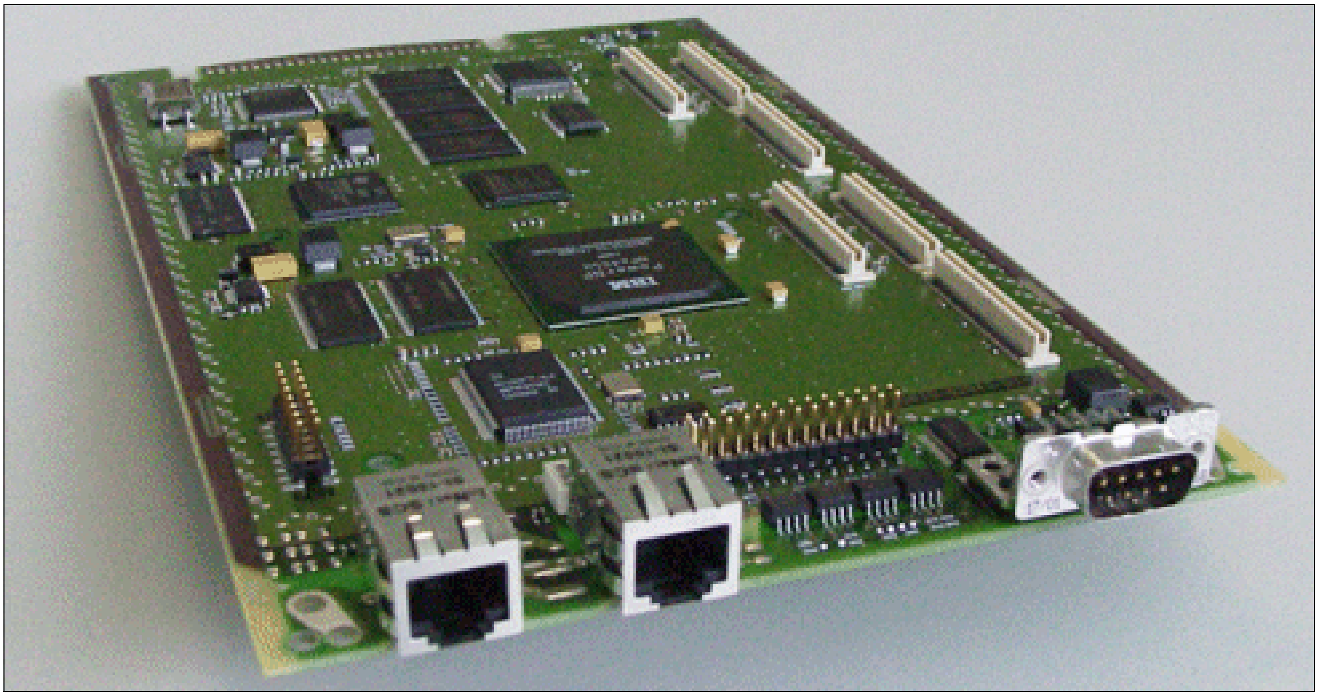


Figure 3-44 HXGS3 (S30810-Q2943-X)

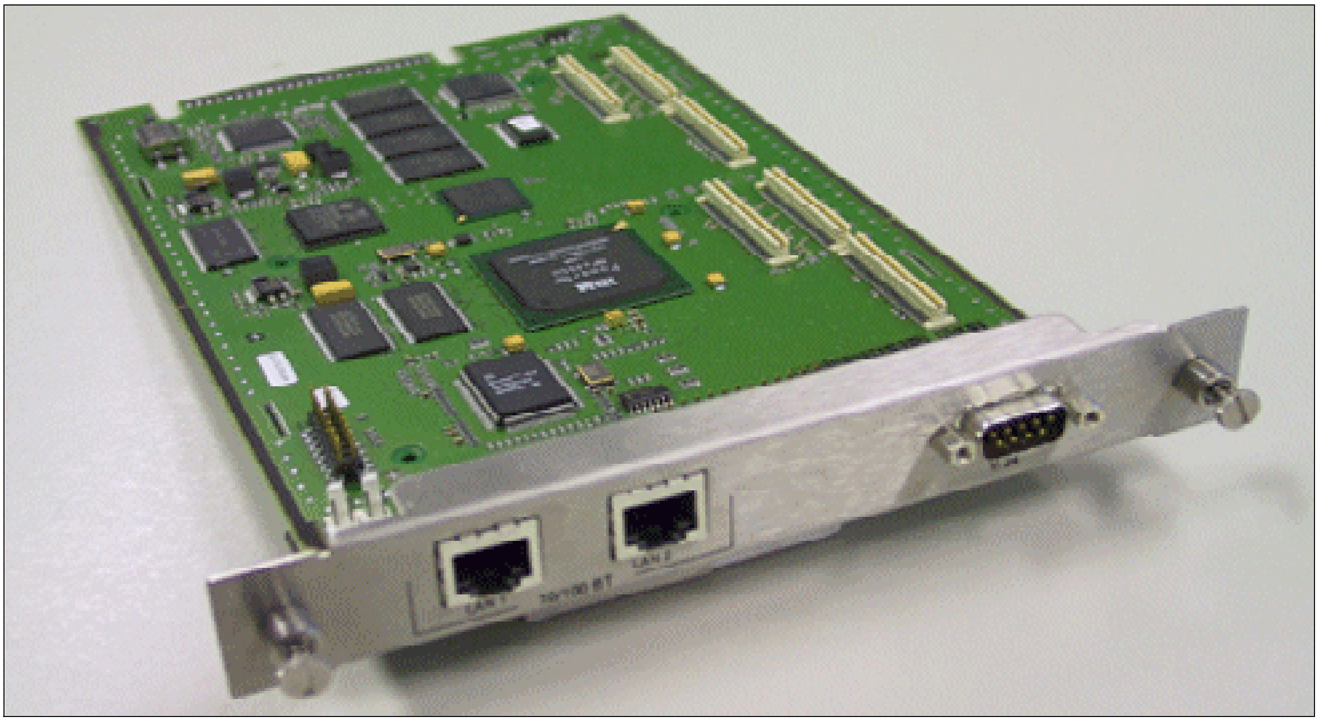


Figure 3-45 HXGR3 (S30810-K2943-Z)

Interfaces/connectors

The HXGS3 and HXGR3 boards provide the following connectors:

- X1: 50-pin connector (edge connector) to the system
- X2: 8-pin RJ45 jack for LAN interface 1
- X3: 8-pin RJ45 jack for LAN interface 2

  Both LAN interfaces allow access to the Ethernet standard (IEEE 802.3) with 10 Mbps or 100 Mbps with automatic configuration. Manual configuration is also possible.
- X4: 9-pin Sub-D plug for V.24 interface

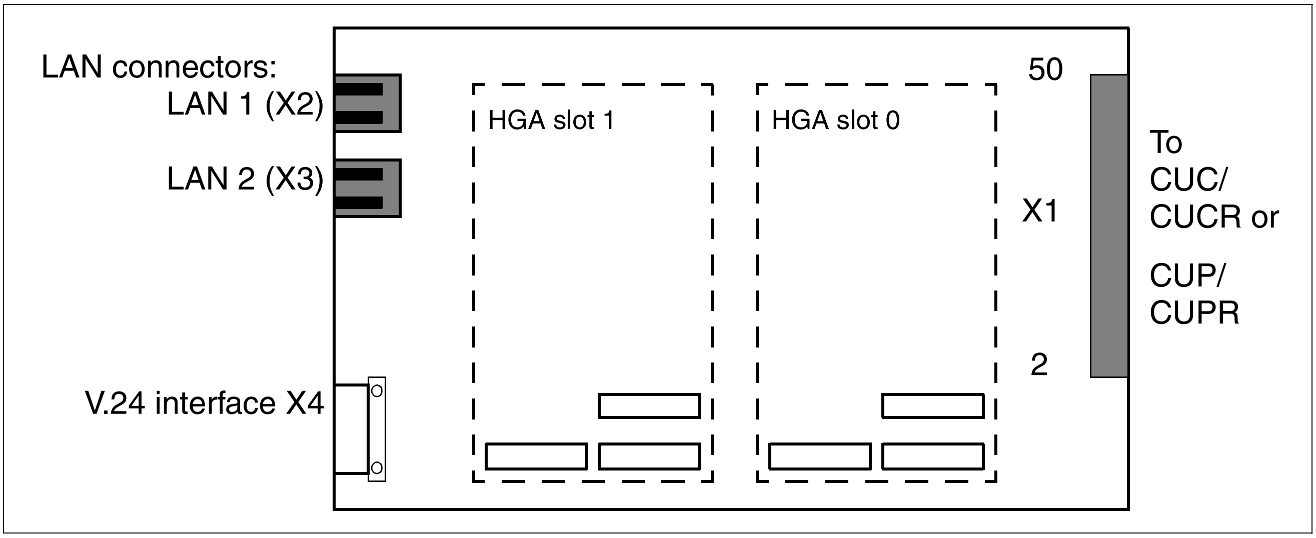

LAN connectors:
LAN 1 (X2)
LAN 2 (X3)
V.24 interface X4
HGA slot 1
HGA slot 0
50
X1
2
To
CUC/
CUCR or
CUP/
CUPR

Figure 3-46 HXGS3/HXGR3 - Interfaces

LAN interfaces

Table 3-43 HXGS3/HXGR3 - LAN Interface Assignment

Pin on HXGS3/HXGR3 (X2 and X3)	Pin of RJ45 connector	Signal
1	1	TDP (Transmit Data +)
3	2	TDN (Transmit Data –)
4	3	RDP (Receive Data +)
–	4	TT1 (Transmit Termination 1)
–	5	TT2 (Transmit Termination 2)
6	6	RDN (Receive Data –)
–	7	RT1 (Receive Termination 1)
–	8	RT2 (Receive Termination 2)
Signals TT1/2 and RT1/2 are not needed for transmitting data. They represent a signal termination of 100 ohms (so-called Bob Smith termination) for the two unused wire pairs in a 4-pair twisted pair cable.		

V.24 interface

The V.24 cable (C30267-Z355-A25) is used for connecting the service PC.

The following settings must be chosen for a terminal or PC connected to the V.24 interface:

Transmission rate	19,200
Data bits	8
Parity bit	None
Stop bits	1
Data flow control	None

It is recommended that the local echo be deactivated on the connected terminal or PC.

Table 3-44 HXGS3/HXGR3 - Assignment of V.24 Interface X10

Pin	Signal	I/O	Remark
1			
2	RxD	I	Internal pull-up resistor in level switch (MAX211E)
3	TxD	O	
4	DTR	O	
5	0 V		Ground
6	DSR	I	Internal pull-up resistor in level switch (MAX211E)
7	RTS	O	
8	CTS	I	Internal pull-up resistor in level switch (MAX211E)
9			

Installing the fan kit for HXGS3 in HiPath 3550 or HiPath 3350

⚠ **Caution**
When an HXGS3 board is used in a HiPath 3550 or HiPath 3350, one fan kit C39165-A7021-D3 must be installed for thermal reasons.

When installing and connecting the fan kit, proceed as follows:

Step	Activity
1.	Disconnect system from power supply. **Caution** System voltage can only be switched off by taking out the power plug. Switch off the battery voltage first for an uninterruptible power supply.
2.	Open the system. **Warning** **Grasp the housing cover by its outside walls only.** The shielding plate on the inside of the cover may have sharp edges which can cause cuts (see Section 4.4.3.4, “Removing the System Housing Cover”).
3.	Place fan kit [A] on the system shelf [B] as shown in Figure 3-47.
4.	Push the two supplied securing clips over positions [C] illustrated in Figure 3-48 to attach the fan kit to the shelf.
5.	Insert the connector of the fan kit cable into the port provided for it on an HXGS3 board as illustrated in Figure 3-49.
6.	Close the system. **Warning** **Grasp the housing cover by its outside walls only.**
7.	Start the system by plugging in the power plug. In the case of an uninterruptible power supply, the battery must then be switched on.

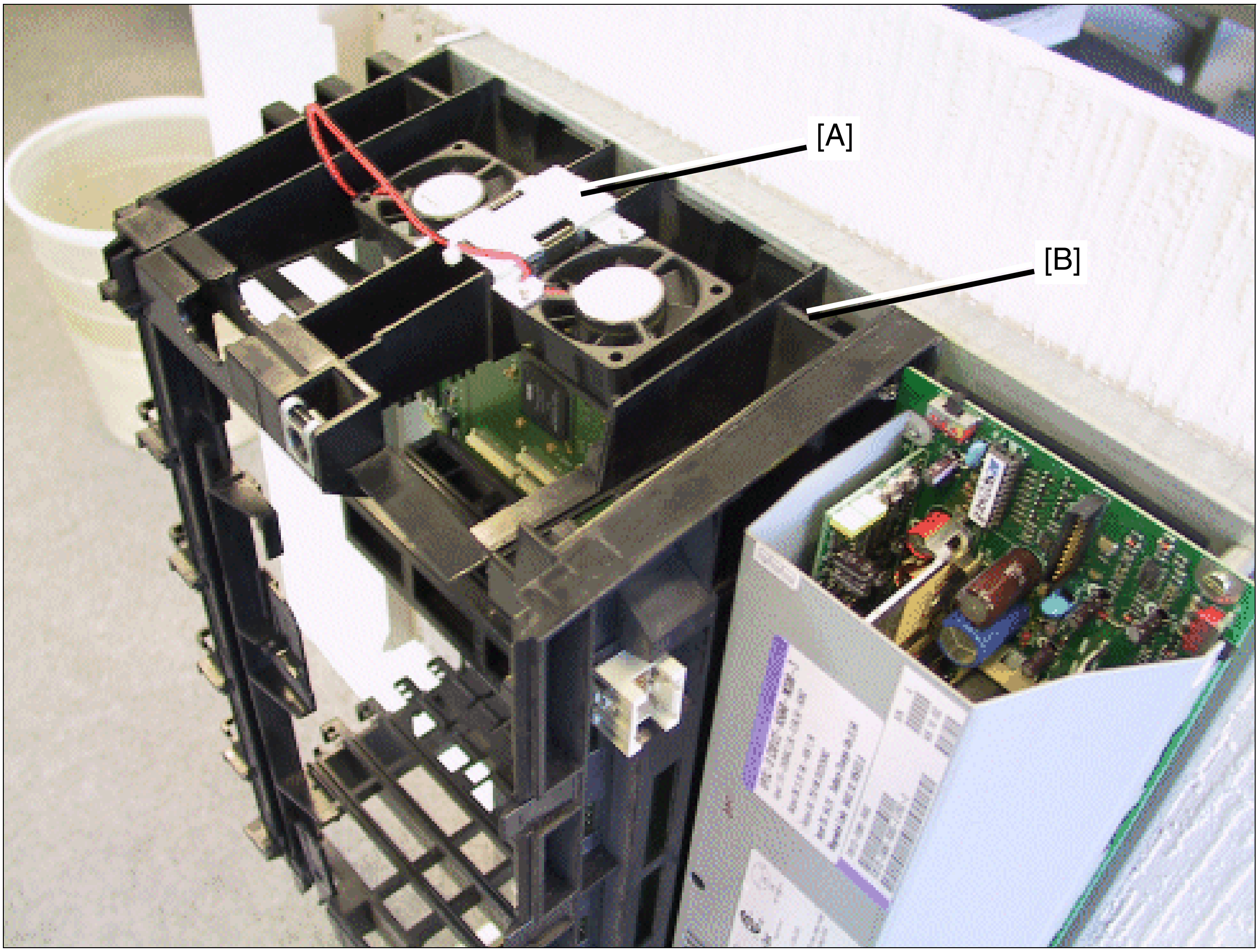


Figure 3-47 HXGS3 - Installation of the Fan Kit in HiPath 3550

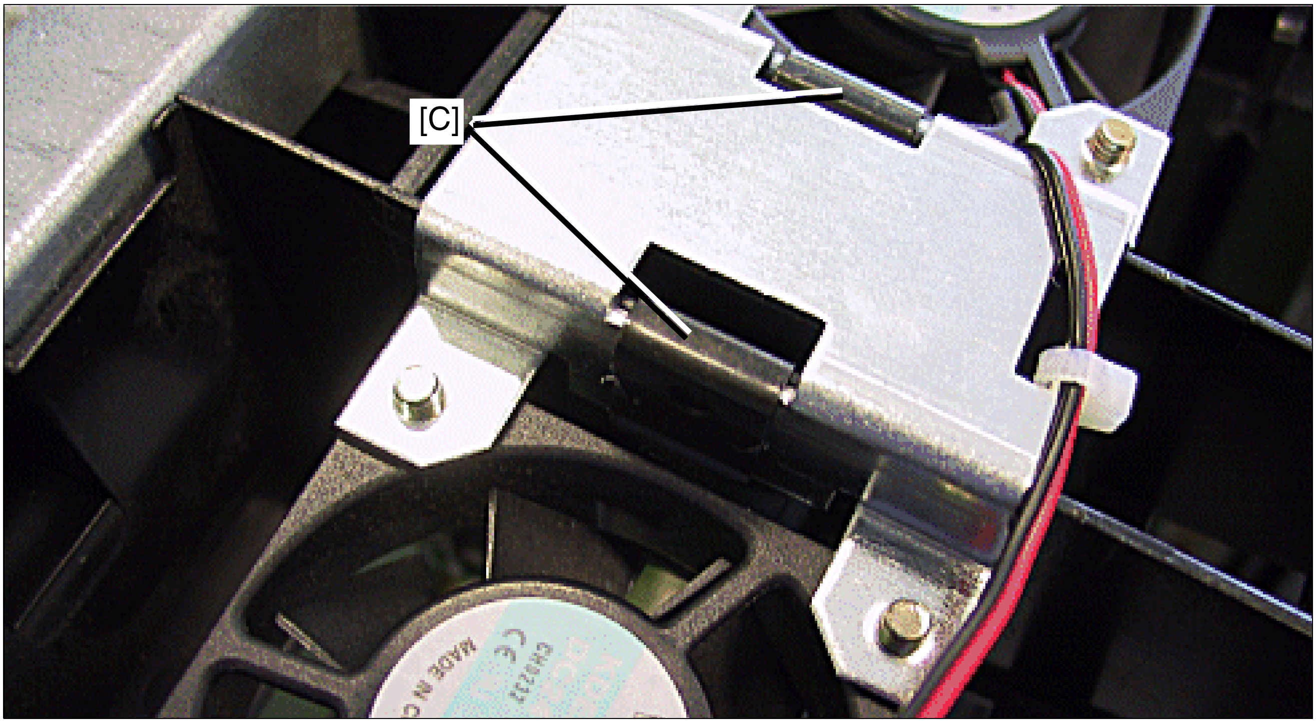


Figure 3-48 HXGS3 - Securing Clips for Fan Kit

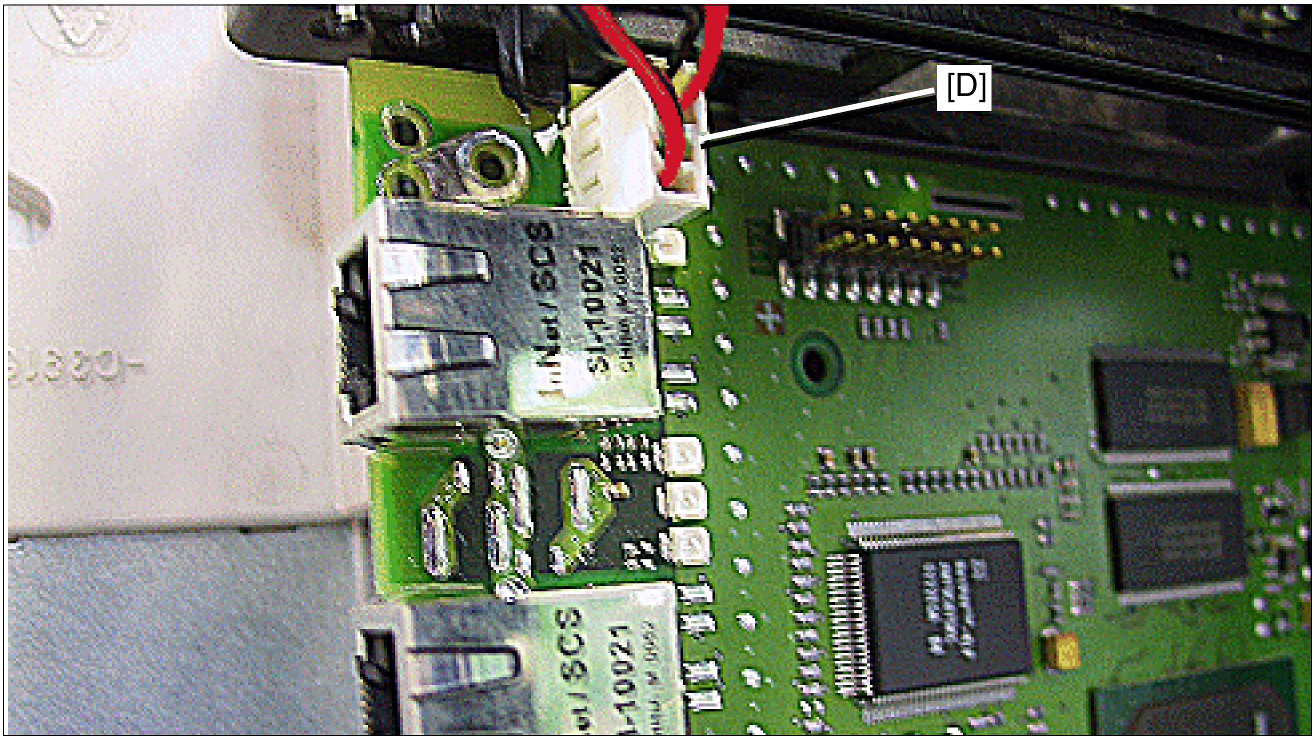


Figure 3-49 HXGS3 - Connection of the Fan Kit

3.3.5 IVML8, IVML24

Introduction

The IVML8 and IVML24 (**I**ntegrated **V**oice **M**ail **L**arge) boards allow you to use the HiPath Xpressions Compact integrated voice mail functionality in HiPath 3750 and HiPath 3700 V1.2 or later. Music on Hold can be used in V4.0 SMR-7 or later and announcements in V5.0 or later.

In addition, the boards have an Ethernet (10/100BaseT) interface which can be used for HiPath Xpressions Compact administration (fast APS transfer, backup and restore activities).

A maximum of one IVML8 or IVML24 is permitted for each HiPath 3750 and HiPath 3700. This board may only be inserted into the slot beside the power supply in the basic cabinet or in the expansion cabinets. Furthermore, the ferrite bead (C39022-Z7000-C7) included with the board must be mounted on the CABLU of the board that is inserted to the immediate left of the IVML8 or IVML.
The rules provided under “Distribution of the PCM segments” on page 4-156 for population with boards must be observed to ensure the non-blocking operation of the system.

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product (see Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).

HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
HiPath Xpressions Compact cannot be used as a central announcement device in a network.

Packing protection covering

You must remove the red packing protection covering (cardboard block), shown in the following picture, before starting up the board.

If it is necessary to transport the board again at a later time, for example, for servicing, you must reattach the packing protection covering.

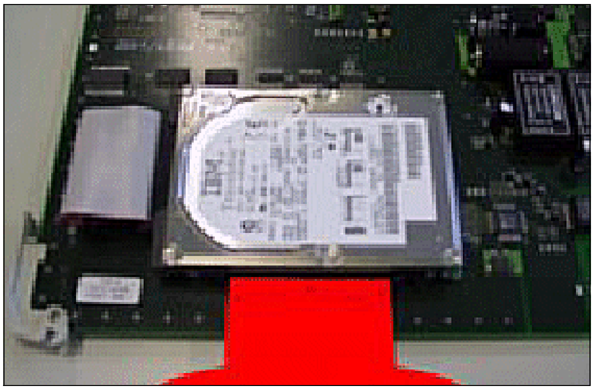


Figure 3-50 IVML8 and IVML24 - Packing Protection Covering

Switches and LEDs

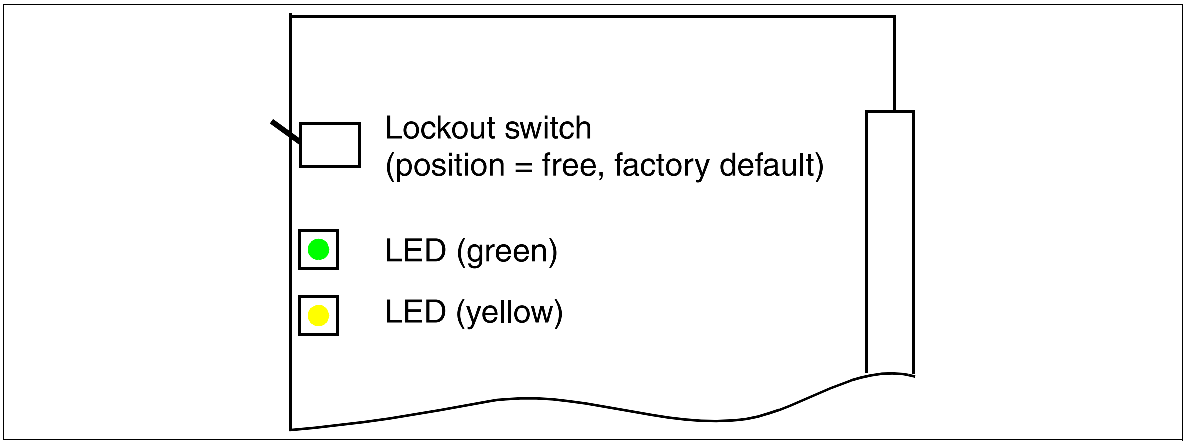


Figure 3-51 IVML8, IVML24 (S30122-X7380-X100, -X)

Lockout switch settings

- Up = free (default)
- Down = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch twice within the first 10 s of board startup.

LED statuses and their meanings

Table 3-45 IVML8 and IVML24 - LED Statuses

LED Yellow	LED Green	Meaning		Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 8 - 12 s)	
On	On	2	LED test (lasts approx. 10 s)	
On Off	Off	3	Lockout switch state signaling by yellow LED (lasts approx. 5 s): ● blocked = On ● free = Off	If necessary, check whether the board was deactivated using HiPath 3000 Manager E or lockout switch.
Flashing (500/ 500 ms)	Off	4	Hard disk test, start of the application (depending on hard disk status, lasts approx. 3 - 8 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.
During Operation				
Off	On	Idle (no call)		
Off	Flashing (500/ 500 ms)	At least one active port (call)		
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)	Lockout switch activated during a call		
On	Off	Board locked or board error occurred		Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.

LAN adapter

The Ethernet LAN interface is accessed via the LAN adapter shown in Figure 3-52 (part no. C39228-A7195-A10), which is connected on the backplane’s (Xx9) SIPAC 1 SU connector. Only shielded cables may be used for the LAN connector (RJ45 jack).

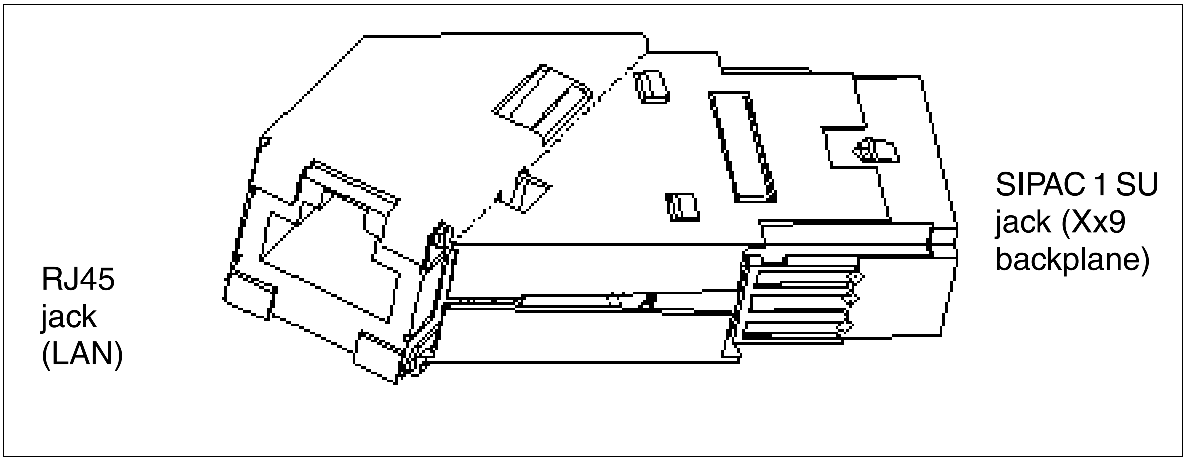


Figure 3-52 LAN Adapter (SIPAC 1 SU - RJ45)

Table 3-46 LAN Adapter Assignment (SIPAC 1 SU - RJ45)

SIPAC 1 SU jack	RJ45 jack	Signal
B1	1	TDP (Transmit Data +)
C2	2	TDN (Transmit Data –)
B3	4	TT1 (Transmit Termination 1)[1]
C4	5	TT2 (Transmit Termination 2)[1]
B5	3	RDP (Receive Data +)
C6	6	RDN (Receive Data –)
B7	7	RT1 (Receive Termination 1)[1]
C8	8	RT2 (Receive Termination 2)[1]

[1] Not used in 4-wire cable

3.3.6 IVMNL, IVMN8

Introduction

The IVMNL and IVMNL8 (**I**ntegrated **V**oice **M**ail **N**ew **L**arge) boards allow you to use the HiPath Xpressions Compact integrated voice mail functionality in HiPath 3800:

- IVMNL (S30122-H7688-X) = 24 ports
- IVMN8 (S30122-H7688-X100) = 8 ports

The boards can also be used for Music on Hold and announcements.

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product (see Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).

HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
HiPath Xpressions Compact cannot be used as a central announcement device in a network.

The Ethernet (10/100BaseT) interface in the front panel of the boards allows HiPath Xpressions Compact administration (fast APS transfer, backup, and restore activities).

Only one IVMNL or IVMN8 may be installed per HiPath 3800 system.

Caution
For thermal reasons the IVMNL board may only be installed in the basic cabinet.

Packing protection covering

You must remove the red packing protection covering (cardboard block), shown in the following picture, before starting up the board.

If it is necessary to transport the board again at a later time, for example, for servicing, you must reattach the packing protection covering.

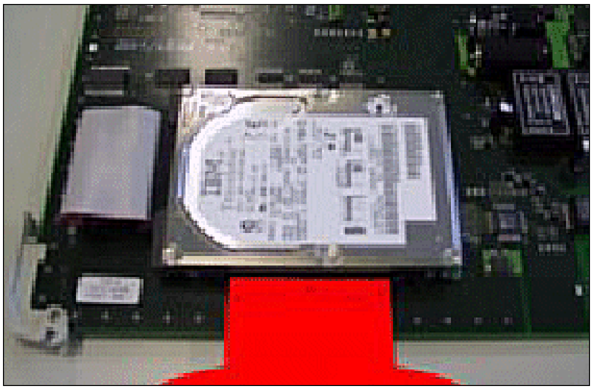
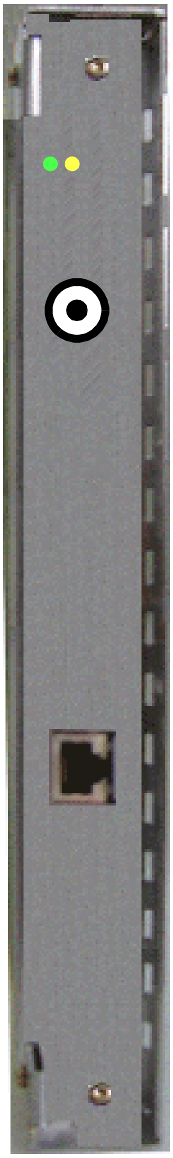


Figure 3-53 IVMNL/IVMN8 - Packing Protection Covering

Front panel



Two LEDs indicating the board status:

- LED (green)
- LED (yellow)

Lockout switch

Ethernet (10/100BaseT) interface (8-pin RJ45 jack)

Figure 3-54 IVMNL/IVMN8 - Front Panel (S30122-H7688-X -X100)

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch four times (off-on-off-on) during the LED test. This action cancels the LED test and both LEDs flash for approximately five seconds in confirmation.

LED statuses and their meanings

Table 3-47 IVMNL/IVMN8 - LED Statuses

LED Red	Green LED	Meaning		Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 8 - 12 s)	
On	On	2	LED test (lasts approx. 10 s)	
On	Off	3	Lockout switch state signaling by red LED (lasts approx. 5 s): ● blocked = On ● free = Off	Possibly check if board was deactivated using HiPath 3000 Manager E or lockout switch.
Off				
Flashing (500/ 500 ms)	Off	4	Hard disk test, start of the application (depending on hard disk status, lasts approx. 3 - 8 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.
During Operation				
Off	On	Idle (no call)		
Off	Flashing (500/ 500 ms)	At least one active port (call)		

Table 3-47 IVMNL/IVMN8 - LED Statuses

LED Red	Green LED	Meaning	Action
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)	Lockout switch activated during a call	
On	Off	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.

RJ45 jack assignment

Table 3-48 IVMNL/IVMN8 - RJ45 Jack Assignment

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.3.7 IVMP8 (not for U.S.), IVMP8R (not for U.S)

Introduction

The following boards are used for the integrated voice mail functionality in HiPath Xpressions Compact in V1.2 and later:

- IVMP8 (**I**ntegrated **V**oice **M**ail **P**oint) S30122-Q7379-X100 - for HiPath 3350 (wall housing)
- IVMP8R (**I**ntegrated **V**oice **M**ail **P**oint **R**ack) S30122-K7379-Z100 - for HiPath 3300 (19-inch housing)

Music on Hold can be used in V4.0 SMR-7 or later and announcements in V5.0 or later.

In addition, the boards have an Ethernet (10/100BaseT) interface which can be used for HiPath Xpressions Compact administration (fast APS transfer, backup and restore activities).

> Only one IVMP8 or IVMP8R may be installed per system.
> Slot 5 can only be used for the IVMP8 board in the HiPath 3350 (wall housing).

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product (see Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).

> HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
> HiPath Xpressions Compact cannot be used as a central announcement device in a network.

Packing protection covering

You must remove the red packing protection covering (cardboard block), shown in the following picture, before starting up the board.

If it is necessary to transport the board again at a later time, for example, for servicing, you must reattach the packing protection covering.

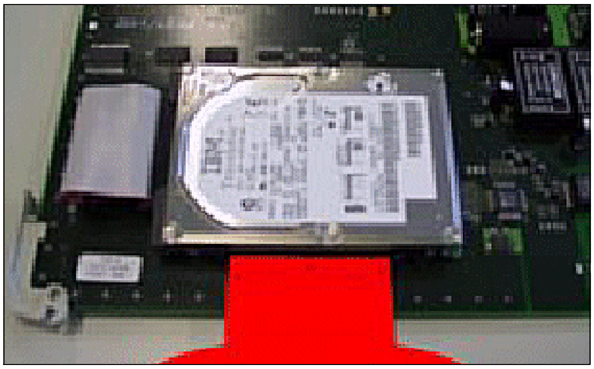


Figure 3-55 IVMP8 and IVMP8R (not for U.S.) - Packing Protection Covering

Switches and LEDs

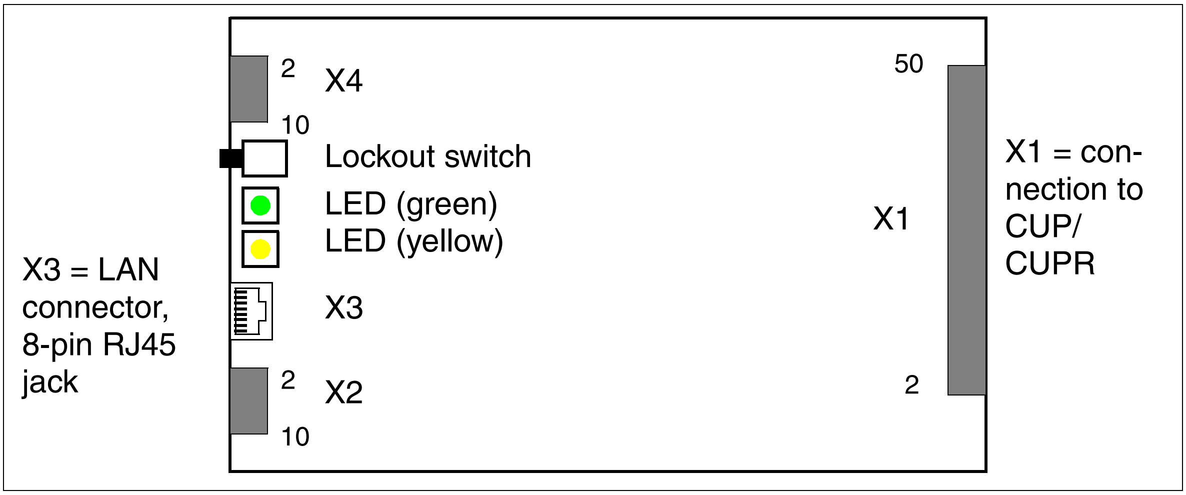

X3 = LAN connector, 8-pin RJ45 jack
2
X4
10
Lockout switch
LED (green)
LED (yellow)
X3
2
X2
10
50
X1
2
X1 = connection to CUP/ CUPR

Figure 3-56 IVMP8, IVMP8R (S30122-Q7379-X100, -K7379-Z100) (not for U.S.)

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch twice within the first 10 s of board startup.

Assignment of the RJ45 jack X3

The Ethernet (10/100BaseT) interface is accessed via the 8-pin RJ45 jack X3. The signals are output simultaneously at the printed circuit connector X2.

Table 3-49 IVMP8 and IVMP8R (not for U.S) - Assignment of the RJ45 Jack X3 (LAN Connector)

RJ45 Jack X3 Pin	Signal	Description	Printed Circuit Connector X2 Pin
1	Tx +	Transmit +	1
2	Tx –	Transmit –	3
3	Rx +	Receive +	7
4	–	Not used	
5	–	Not used	
6	Rx –	Receive –	9
7	–	Not used	
8	–	Not used	

LED statuses and their meanings

Table 3-50 IVMP8 and IVMP8R (not for U.S.) - LED Statuses

LED Yellow	LED Green	Meaning		Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 8 - 12 s)	
On	On	2	LED test (lasts approx. 10 s)	
On	Off	3	Lockout switch state signaling by yellow LED (lasts approx. 5 s): ● blocked = On ● free = Off	Possibly check if board was deactivated using HiPath 3000 Manager E or lockout switch.
Off				
Flashing (500/ 500 ms)	Off	4	Hard disk test, start of the application (depending on hard disk status, lasts approx. 3 - 8 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.
During Operation				
Off	On	Idle (no call)		
Off	Flashing (500/ 500 ms)	At least one active port (call)		
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)	Lockout switch activated during a call		
On	Off	Board locked or board error occurred		Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.

3.3.8 IVMS8, IVMS8R

Introduction

The following boards are used for the integrated voice mail functionality in HiPath Xpressions Compact in V1.2 and later:

- IVMS8 (**I**ntegrated **V**oice **M**ail **S**mall) S30122-Q7379-X - for HiPath 3550 and HiPath 3350 (wall housing)
- IVMS8R (**I**ntegrated **V**oice **M**ail **S**mall **R**ack) S30122-K7379-Z - for HiPath 3500 and HiPath 3300 (19-inch housing)

Music on Hold can be used in V4.0 SMR-7 or later and announcements in V5.0 or later.

In addition, the boards have an Ethernet (10/100BaseT) interface which can be used for HiPath Xpressions Compact administration (fast APS transfer, backup and restore activities).

> Only one IVMS8 or IVMS8R may be installed per system.
> For thermal reasons, the IVMS8 board may only be used in slots 5, 7 and 9 (lower slots) in the HiPath 3550 (wall housing).
> Slot 5 can only be used for the IVMS8 board in the HiPath 3350 (wall housing).

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product (see Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).

> HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
> HiPath Xpressions Compact cannot be used as a central announcement device in a network.

Packing protection covering

You must remove the red packing protection covering (cardboard block), shown in the following picture, before starting up the board.

If it is necessary to transport the board again at a later time, for example, for servicing, you must reattach the packing protection covering.

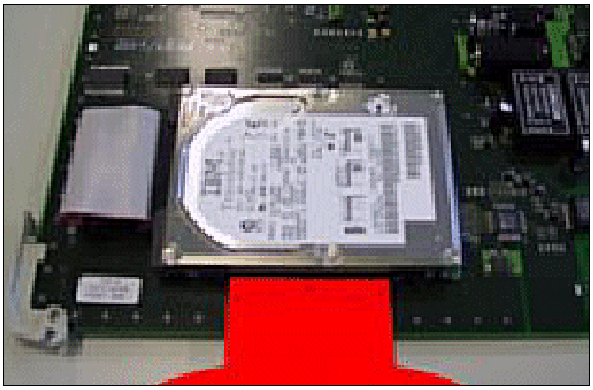


Figure 3-57 IVMS8 and IVMS8R - Packing Protection Covering

Switches and LEDs

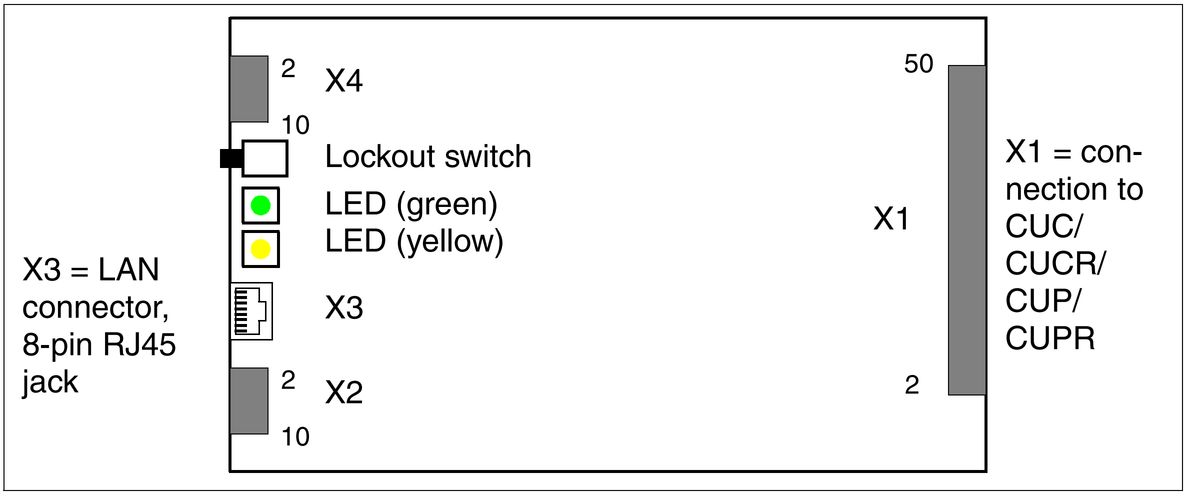

2
X4
10
Lockout switch
LED (green)
LED (yellow)
X3 = LAN connector, 8-pin RJ45 jack
X3
2
X2
10
50
X1
2
X1 = connection to CUC/ CUCR/ CUP/ CUPR

Figure 3-58 IVMS8 and IVMS8R (S30122-Q7379-X, -K7379-Z)

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch twice within the first 10 s of board startup.

Front view of IVMS8R

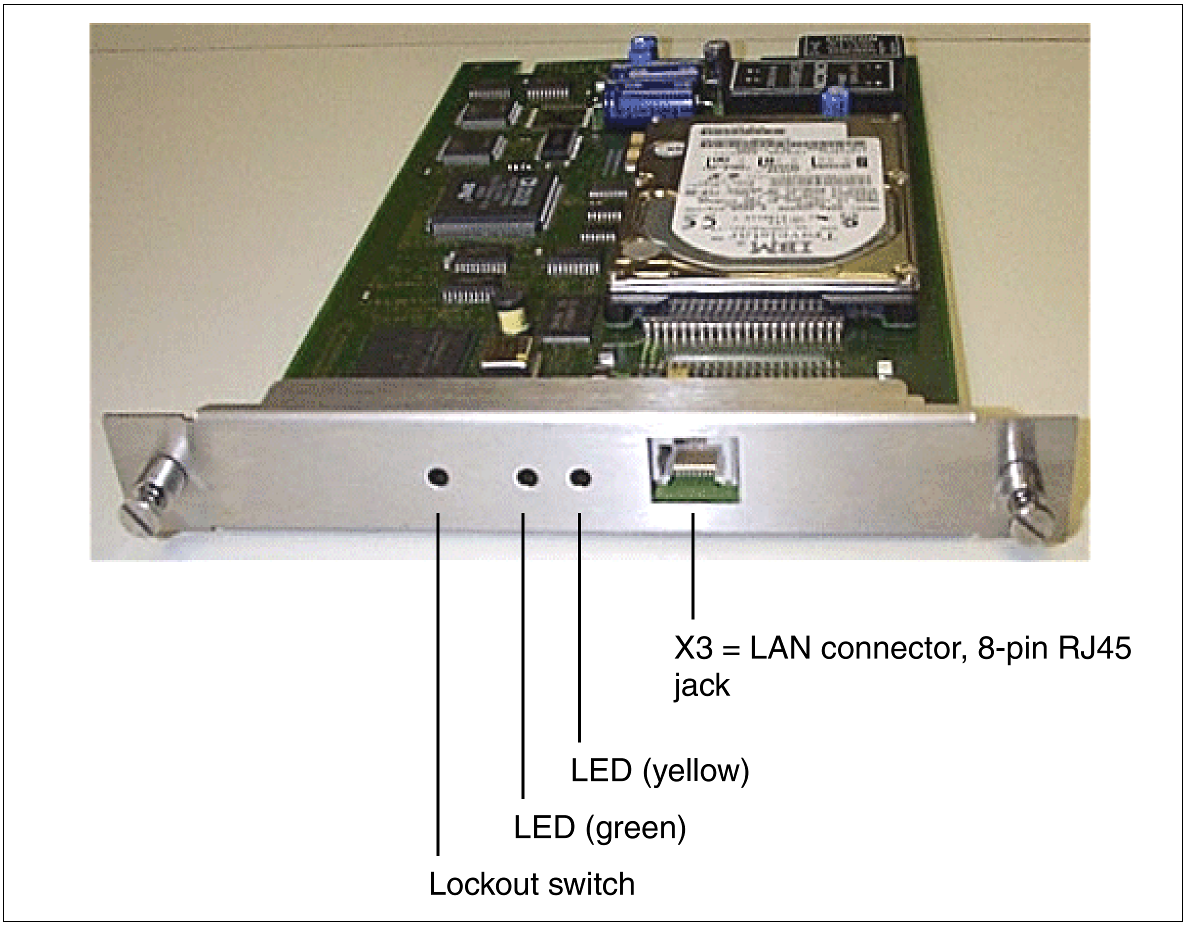

X3 = LAN connector, 8-pin RJ45 jack
LED (yellow)
LED (green)
Lockout switch

Figure 3-59 IVMS8R - Front View (S30122-K7379-Z)

Assignment of the RJ45 jack X3

The Ethernet (10/100BaseT) interface is accessed via the 8-pin RJ45 jack X3. The signals are output simultaneously at the printed circuit connector X2.

Table 3-51 IVMS8 and IVMS8R - Assignment of the RJ45 Jack X3 (LAN Connector)

RJ45 Jack X3 Pin	Signal	Description	Printed Circuit Connector X2 Pin
1	Tx +	Transmit +	1
2	Tx –	Transmit –	3
3	Rx +	Receive +	7
4	–	Not used	
5	–	Not used	
6	Rx –	Receive –	9
7	–	Not used	
8	–	Not used	

LED statuses and their meanings

Table 3-52 IVMS8 and IVMS8R - LED Statuses

<table>
<tr><th>LED Yellow</th><th>LED Green</th><th colspan="2">Meaning</th><th>Action</th></tr>
<tr><td colspan="5">During Startup and Initialization</td></tr>
<tr><td>Off</td><td>Off</td><td>1</td><td>Boot procedure (lasts approx. 8 - 12 s)</td><td></td></tr>
<tr><td>On</td><td>On</td><td>2</td><td>LED test (lasts approx. 10 s)</td><td></td></tr>
<tr><td>On</td><td rowspan="2">Off</td><td rowspan="2">3</td><td rowspan="2">Lockout switch state signaling by yellow LED (lasts approx. 5 s):
● blocked = On
● free = Off</td><td rowspan="2">Possibly check if board was deactivated using HiPath 3000 Manager E or lockout switch.</td></tr>
<tr><td>Off</td></tr>
<tr><td>Flashing (500/ 500 ms)</td><td>Off</td><td>4</td><td>Hard disk test, start of the application (depending on hard disk status, lasts approx. 3 - 8 minutes)</td><td></td></tr>
<tr><td>Off</td><td>On</td><td>5a</td><td>Standby mode after successful boot</td><td></td></tr>
<tr><td>On</td><td>Off</td><td>5b</td><td>Board locked or board error occurred</td><td>Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.</td></tr>
<tr><td colspan="5">During Operation</td></tr>
<tr><td>Off</td><td>On</td><td colspan="2">Idle (no call)</td><td></td></tr>
<tr><td>Off</td><td>Flashing (500/ 500 ms)</td><td colspan="2">At least one active port (call)</td><td></td></tr>
<tr><td>Flashing (500/ 500 ms)</td><td>Flashing (500/ 500 ms)</td><td colspan="2">Lockout switch activated during a call</td><td></td></tr>
<tr><td>On</td><td>Off</td><td colspan="2">Board locked or board error occurred</td><td>Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.</td></tr>
</table>

3.3.9 PBXXX

Introduction

The PBXXX (**P**eripheral **B**oard **XXX**) module can be used in HiPath 3800 to support country-specific CAS protocols.

The board converts the Euro-ISDN protocol on an S_{2M} link into the Channel Associated Signaling (CAS) protocol. The board functions only in conjunction with a DIUN2. PBXXX must always be plugged in to the left, next to DIUN2.

Because the PBXXX card is not recognized by the hardware, offline configuration is required with HiPath 3000 Manager E. DIUN2 + PBXXX should be specified as the module to be configured. After configuration, the module data can be seen in HiPath 3000 Manager E. However, this is only visible in the software configuration, as the PBXXX card was only configured on the software side.

Note: The offline configuration of the PBXXX serves solely to visualize the card with HiPath 3000 Manager E.

Front panel

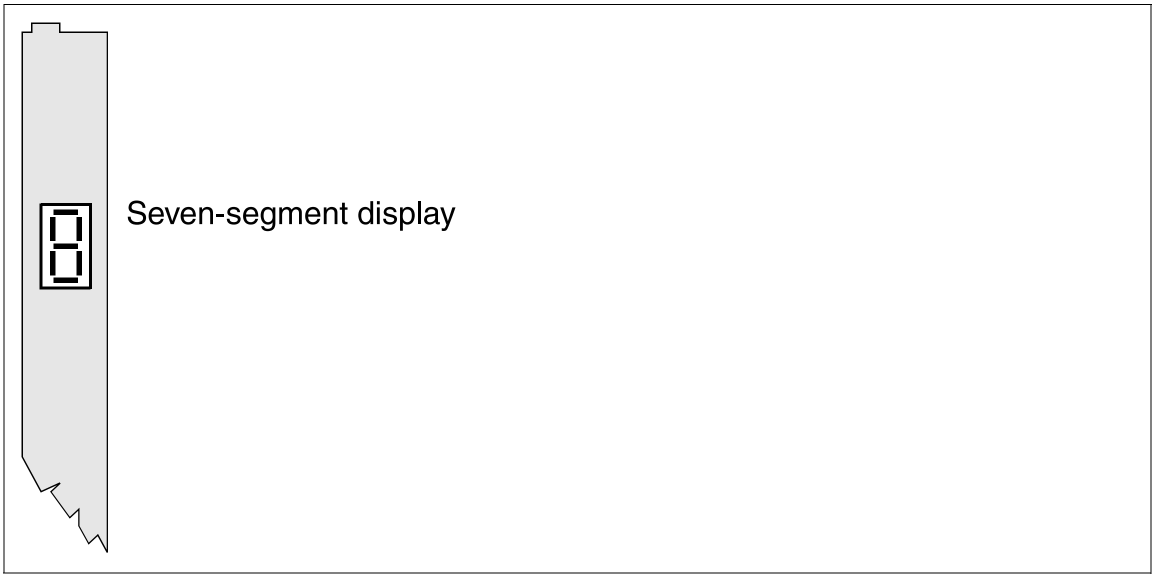


Figure 3-60 PBXXX (S30810-Q6401-X) Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

Seven-segment display

The board statuses listed in the following table are displayed.

Table 3-53 PBXXX:- Seven Segment Display

Display	Meaning
0	Waiting for the PBXXX software download
1	Starting the PBXXX software download
3	PBXXX software download
7	Writing the PBXXX software/extender software to the flash memory
8	Loading the PBXXX software/extender software from the flash memory
E	Waiting for ECGM command (10 s)
F	Error while writing the software to flash memory
H	No software in the flash memory, waiting for reload
F E	Flash memory erased (changing display)
o	PBXXX card active, Link 1 and Link 2 not active
P	Link 1 active, Link 2 not active
q	Link 1 not active, Link 2 active
A	Link 1 active, Link 2 active
]	Boot procedure

3.3.10 SLA8N (not for U.S.), SLA16N, SLA24N

Introduction

The peripheral boards

- SLA8N (**S**ubscriber **L**ine **A**nalog) with eight analog T/R interfaces (not for U.S.)
- SLA16N (16 analog interfaces)
- SLA24N (24 analog interfaces)

can be used in HiPath 3750, HiPath 3550 and HiPath 3700.

Switches and LEDs

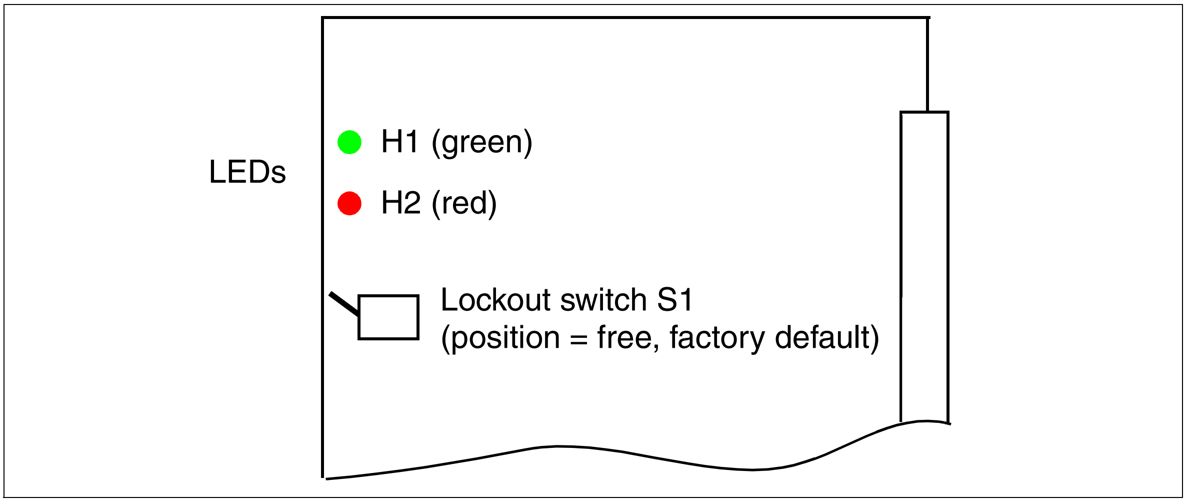


Figure 3-61 SLA8N (not for U.S.), SLA16N, SLA24N (S30810-Q2929-X200, -X100, -X)

The operating mode (short or long line with the appropriate flash times) can be set up for each subscriber line interface with HiPath 3000 Manager E (the menu Settings: Set up station –> Station –> Parameters –> Flags).

LED statuses and their meanings

Table 3-54 SLA8N (Not For U.S.), SLA16N, SLA24N - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one station is activated.	

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-55 SLA8N, SLA16N, SLA24N Assignment Cable 1 (SU Xx8) (Not for U.S.)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLA8N, SLA16N, SLA24N		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes
				BP: Xx8					
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	Not used in SLA8N
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

Table 3-56 SLA8N, SLA16N, SLA24N - Assignment Cable 2 (SU Xx9) (Not for U.S.)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLA8N, SLA16N, SLA24N		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes
				BP: Xx9					
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	not used in SLA8N, SLA16N
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

Table 3-57 SLA16N, SLA24N - Assignment (SU Xx8, Xx9) (For U.S. Only)

#	a-Wire (Tip)	b-Wire (Ring)	SU connector		SLA16N, SLA24N		CHAMP jack, MDF		Notes
			BP: Xx8	BP: Xx9					
1	wht/blu		19		1a	Port 1	1	1a	
		blu/wht	39		1b		26	1b	
2	wht/ora		38		2a	Port 2	2	2a	
		ora/wht	48		2b		27	2b	
3	wht/grn		27		3a	Port 3	3	3a	
		grn/wht	47		3b		28	3b	
4	wht/brn		16		4a	Port 4	4	4a	
		brn/wht	46		4b		29	4b	
5	wht/gry		05		5a	Port 5	5	5a	
		gry/wht	45		5b		30	5b	
6	red/blu		14		6a	Port 6	6	6a	
		blu/red	44		6b		31	6b	
7	red/ora		23		7a	Port 7	7	7a	
		ora/red	43		7b		32	7b	
8	red/grn		32		8a	Port 8	8	8a	
		grn/red	42		8b		33	8b	
9	red/brn		11		9a	Port 9	9	9a	
		brn/red	31		9b		34	9b	
10	red/gry		02		10a	Port 10	10	10a	
		gry/red	22		10b		35	10b	
11	blk/blu		13		11a	Port 11	11	11a	
		blu/blk	33		11b		36	11b	
12	blk/ora		04		12a	Port 12	12	12a	
		ora/blk	24		12b		37	12b	
13	blk/grn		15		13a	Port 13	13	13a	
		grn/blk	35		13b		38	13b	
14	blk/brn		06		14a	Port 14	14	14a	
		brn/blk	26		14b		39	14b	
15	blk/gry		17		15a	Port 15	15	15a	
		gry/blk	37		15b		40	15b	
16	yel/blu		08		16a	Port 16	16	16a	
		blu/yel	28		16b		41	16b	

Table 3-57 SLA16N, SLA24N - Assignment (SU Xx8, Xx9) (For U.S. Only)

#	**a-Wire (Tip)**	**b-Wire (Ring)**	**SU connector**		**SLA16N, SLA24N**		**CHAMP jack, MDF**		**Notes**
			BP: Xx8	**BP: Xx9**					
17	red/brn			11	17a	Port 17	9	9a	Not used in SLA16N
		brn/red		31	17b		34	9b	
18	red/gry			02	18a	Port 18	10	10a	
		gry/red		22	18b		35	10b	
19	blk/blu			13	19a	Port 19	11	11a	
		blu/blk		33	19b		36	11b	
20	blk/ora			04	20a	Port 20	12	12a	
		ora/blk		24	20b		37	12b	
21	blk/grn			15	21a	Port 21	13	13a	
		grn/blk		35	21b		38	13b	
22	blk/brn			06	22a	Port 22	14	14a	
		brn/blk		26	22b		39	14b	
23	blk/gry			17	23a	Port 23	15	15a	
		gry/blk		37	23b		40	15b	
24	yel/blu			08	24a	Port 24	16	16a	
		blu/yel		28	24b		41	16b	

Technical connection conditions

- Maximum supply current: approximately 34 mA; maximum supply voltage: approximately 40 Vdc
- Ring voltage against negative supply voltage (a-wire (tip)/RING): two telephones maximum
- Range, see Section 2.6
- Loop current detection > 10 mA
- Ground button detection > 20 mA
- The transmission method can be configured country-specifically by entering the country code.

3.3.11 SLC16 (Not for U.S.), SLC16N (Not for U.S.)

Introduction

The SLC16 (**S**ubscriber **L**ine Module **C**ordless) and SLC16N boards connect base stations for HiPath Cordless Office to

- HiPath 3750 and HiPath 3700 (max. four SLC16s or SLC16Ns per system).
- HiPath 3550 (max. one SLC16 or SLC16N per system).

The new board SLC16N is an optimized version of SLC16. Both boards have the same scope and are fully compatible from a technical perspective. SLC16 and SLC16N boards can be used in mixed mode within a single system. SLC16N can be used in specific SMRs of V1.2 and V3.0. Details on this can be found in the relevant sales release.

Chapter 11 contains basic information on the options available for the use of HiPath Cordless Office.

> For initial installation of the HiPath Cordless Office, the HiPath cordless system number (DECT ID) must be ordered together with the SLC16/SLC16N board. Replacement boards are always delivered without a HiPath cordless system number.
> Installing the SLC16 or SLC16N and entering the HiPath cordless system number releases 16 mobile units for use (PIN numbers are assigned). These mobile units can then be logged on to the system. Any additional mobile units to be used must first be released (see Section 10.9.6).

Base stations must be clocked with a high degree of accuracy for HiPath Cordless Office. Install the plug-in CMS subboard on the CBCPR board (HiPath 3750 and HiPath 3700) or the plug-in CMA or CMS subboard on the CBCC board (for HiPath 3550) to ensure clock accuracy (see Table 11-1).

Switches and LEDs

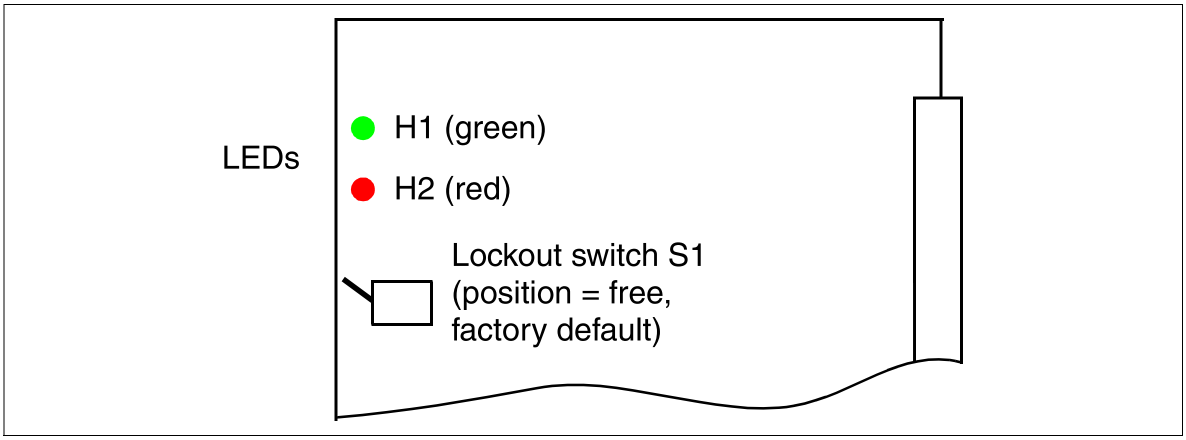

LEDs
H1 (green)
H2 (red)
Lockout switch S1
(position = free,
factory default)

Figure 3-62 SLC16 (S30810-Q2922-X) (Not for U.S.)

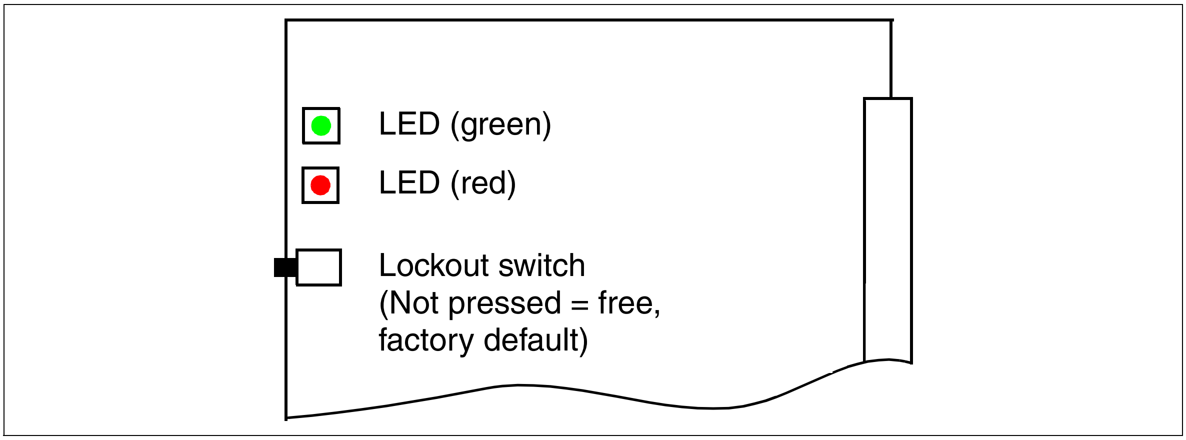

LED (green)
LED (red)
Lockout switch
(Not pressed = free,
factory default)

Figure 3-63 SLC16N (S30810-Q2193-X100) (Not for U.S.)

Activate the lockout switch (SLC16 = flip switch down. SLC16N = Press switch), all idle cordless phones are blocked. Active mobile telephones are not locked until their release keys are pressed.
Before unplugging the SLC16 or SLC16N board, always activate the lockout switch and wait until green LED stops flashing. This precaution ensures that none of the mobile telephones are active.

LED statuses and their meanings

Table 3-58 SLC16, SLC16N (Not for U.S.) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	
On	On	Board disabled.	Check whether board was deactivated using the lockout switch.

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-59 SLC16, SLC16N (Not for U.S.) - Cable Assignment

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLC16 SLC16N		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes
				BP: Xx8					
1	1	wht/blu		19	1a	Access 1	1a	4	BS 1: $U_{P0/E}$ port 1
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Access 2	2a	4	BS x: $U_{P0/E}$ port x
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Access 3	3a	4	BS x: $U_{P0/E}$ port x
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Access 4	4a	4	BS x: $U_{P0/E}$ port x
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Access 5	5a	4	BS x: $U_{P0/E}$ port x
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Access 6	6a	4	BS x: $U_{P0/E}$ port x
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Access 7	7a	4	BS x: $U_{P0/E}$ port x
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Access 8	8a	4	BS x: $U_{P0/E}$ port x
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Access 9	9a	4	BS x: $U_{P0/E}$ port x
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Access 10	10a	4	BS x: $U_{P0/E}$ port x
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Access 11	11a	4	BS x: $U_{P0/E}$ port x
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Access 12	12a	4	BS x: $U_{P0/E}$ port x
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Access 13	13a	4	BS x: $U_{P0/E}$ port x
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Access 14	14a	4	BS x: $U_{P0/E}$ port x
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Access 15	15a	4	BS x: $U_{P0/E}$ port x
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Access 16	16a	4	BS x: $U_{P0/E}$ port x
			blu/yel	28	16b		16b	5	

SLC16 and SLC16N system configuration

For information on the maximum possible system configuration of HiPath Cordless Office with the SLC16 and SLC16N boards see Table 11-1.

SLC16 and SLC16N board distribution in HiPath 3750 and HiPath 3700 cabinets

You can install up to four SLC16 or SLC16N boards in HiPath 3750 and HiPath 3700. Please note the following when distributing the boards in the individual cabinets:

- Basic cabinet (BC)
  Up to two SLC16s or SLC16Ns can be installed in the basic cabinet. Sixteen BS3/1s or eight BS2/2s and BS3/3s can also be connected.
- Expansion cabinets EC1 and EC2
  The four SLC16s or SLC16Ns can be installed in a single expansion cabinet. And up to sixteen BS3/1s or eight BS2/2s and BS3/3s can be connected per SLC16 or SLC16N. To avoid overloading the power supply when operating four SLC16s or SLC16Ns in a single expansion cabinet, you must not install any other peripheral boards in this cabinet.

> To guarantee uninterrupted operation of HiPath 3750 and HiPath 3700, the SLC16 or SLC16N should not be installed with a second SLC16 or SLC16N, an SLMO24 or a TS2 on a PCM segment. This condition must always be observed.
> For information on PCM segment distribution, see Page 4-156.

Supplying power to base stations

Power is supplied to the base stations primarily via the internal PSU in the system in question.

- HiPath 3750 and HiPath 3700
  The internal system power supply unit provides sufficient power to the configurations mentioned in Table 3-60.
  For distances of up to 1000 m (at 2x0.6 mm) between the SLC16 or SLC16N and base station, the BS2/2 and BS3/3 must each be connected via two $U_{P0/E}$ interfaces. Only one $U_{P0/E}$ interface is required for BS3/1 base stations.

Table 3-60 HiPath 3750, HiPath 3700 - Maximum Number of SLA24N and SLMO24 User Groups (Depending on the Number of Base Stations Connected at SLC16 or SLC16N (Not for U.S.)

HiPath 3750 **HiPath 3700**	**Number of SLC16 SLC16N**	**Number of base stations**		**Number of SLA24N SLMO24**
		BS3/1 **BS4** **connected via 1x$U_{P0/E}$**	**BS2/2** **BS3/3** **BS4** **connected via 2x$U_{P0/E}$**	
BC	0	0	0	7
	1	16	8	5
	2	32	16	3
Expansion cabinet	0	0	0	8
	1	16	8	6
	2	32	16	4
	3	48	24	2
	4	64	32	0

- HiPath 3550
  Subject to certain prerequisites, the system-internal PSU UPSC-D provides sufficient power for the operation of sixteen BS3/1s (one $U_{P0/E}$ each) or eight BS2/2s and BS3/3s (two $U_{P0/E}$ each). These prerequisites depend on the
  - Line length and line type between SLC16 or SLC16N and base station.
    The following specifications are based on line lengths of up to 1000 m and a line type 2x0.6 mm per $U_{P0/E}$.
  - Number and type of corded telephones connected to the system.
    Table 3-61 through Table 3-63 show which telephone configurations work without additional power supply.

Table 3-61 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16 or SLC16N (Not for U.S.)

Number of BS3/1s and BS4s connected via 1x$U_{P0/E}$ to SLC16 or SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
1	66	61	57	53	48	44
2	63	59	54	50	46	41
3	60	56	52	47	43	39
4	58	53	49	45	40	36
5	55	51	47	42	38	33
6	53	48	44	40	35	31
7	50	46	41	37	33	28
8	47	43	39	34	30	26
9	45	40	36	32	27	23
10	42	38	33	29	25	20
11	40	35	31	27	22	18
12	37	33	28	24	20	15
13	34	30	26	21	17	13
14	32	27	23	19	14	10
15	29	25	20	16	12	7
16	27	22	18	13	9	5

Table 3-62 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS2/2 Base Stations Connected to SLC16 or SLC16N (Not for U.S.)

Number of BS2/2s on SLC16 or SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
1	63	59	54	50	46	41
2	58	53	49	45	40	36
3	53	48	44	40	35	31
4	47	43	39	34	30	26
5	42	38	33	29	25	20
6	37	33	28	24	20	15
7	32	27	23	19	14	10
8	27	22	18	13	9	5

Table 3-63 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/3 Base Stations Connected to SLC16 or SLC16N (Not for U.S.)

Number of BS3/3s and BS4s connected via 2xU$_{P0/E}$ to SLC16 or SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
1	64	60	56	51	47	42
2	60	56	52	47	43	39
3	57	52	48	43	39	35
4	53	48	44	40	35	31
5	49	44	40	36	31	27
6	45	40	36	32	27	23
7	41	37	32	28	23	19
8	37	33	28	24	20	15

Options for supplying power to the base stations

For information on connecting the base stations, refer to the HiPath Cordless Office service manual.

Each base station must be connected to the SLC16 or SLC16N via the main distribution frame (MDFU or MDFU-E).

Always route the $U_{P0/E}$ interfaces on the SLC16 or SLC16N via a splitting strip to ensure that surges due to lightning will be arrested. To do so, insert the polarized surge protectors (supplied) in the plugging locations on the splitting strip from above.

The following options are available for supplying power to the base stations:

- Power supply via one $U_{P0/E}$ interface (Page 3-148)
- Power supply via two $U_{P0/E}$ interfaces (Page 3-149)
- Power supply via three $U_{P0/E}$ interfaces (Page 3-150), for BS3/3 only

If the power supplied by the UPSC-D (HiPath 3550) is insufficient, additional power can be supplied by installing the external power supply EPSU2 (Page 3-150).

Signal propagation times differ due to the varying distances between the base stations, the system, and the connection cables used (refer to the HiPath Cordless Office service manual). The SLC16 and SLC16N boards automatically balance these propagation times.

Base station power supply via one $U_{P0/E}$ interface

Connect the base station to a free interface on SLC16 or SLC16N as shown in Figure 3-64. Be careful not to exceed the maximum connection cable lengths (1000 m for 2x0.6 mm).

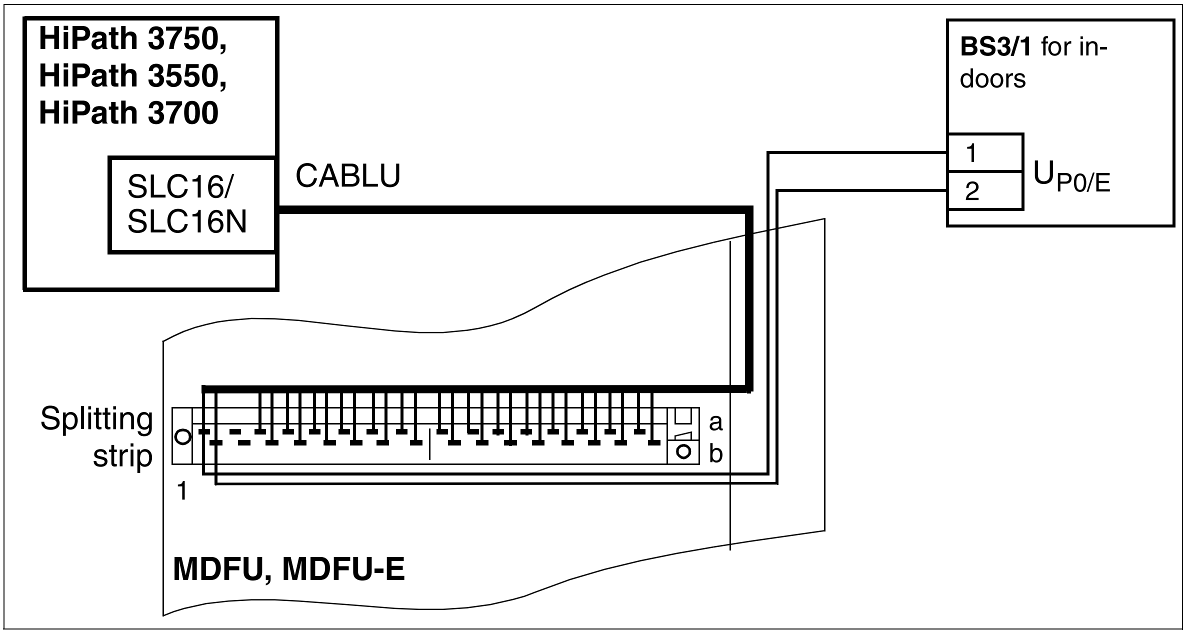

HiPath 3750,
HiPath 3550,
HiPath 3700
SLC16/
SLC16N
CABLU
BS3/1 for in-doors
1
2
$U_{P0/E}$
Splitting strip
1
a
b
MDFU, MDFU-E

Figure 3-64 Base Station Power Supply via One $U_{P0/E}$ Interface (Not for U.S.)

Base station power supply via two $U_{P0/E}$ interfaces

Connect the base station to two free interfaces on SLC16 or SLC16N as shown in Figure 3-65. Be careful not to exceed the maximum connection cable lengths (1000 m for 2x0.6 mm). Using two $U_{P0/E}$ interfaces increases the traffic capacity in BS2/2 and BS3/3 base stations.

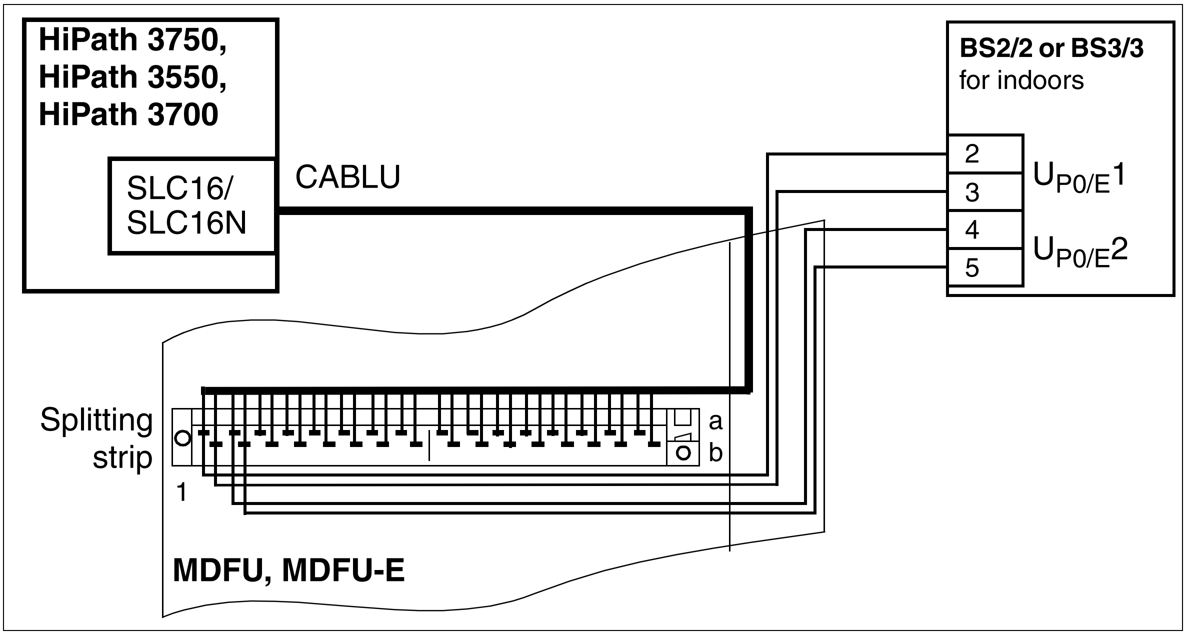

HiPath 3750,
HiPath 3550,
HiPath 3700
SLC16/
SLC16N
CABLU
BS2/2 or BS3/3
for indoors
2
3
4
5
$U_{P0/E}1$
$U_{P0/E}2$
Splitting
strip
a
b
1
MDFU, MDFU-E

Figure 3-65 Base Station Power Supply via Two $U_{P0/E}$ Interfaces (Not for U.S.)

BS3/3 power supply via three $U_{P0/E}$ interfaces

Connect the BS3/3 base station to three free interfaces on the SLC16 or SLC16N as shown in Figure 3-66. Be careful not to exceed the maximum connection cable lengths (1000 m for 2x0.6 mm).
Using three $U_{P0/E}$ interfaces increases the traffic capacity in the BS3/3 base station.

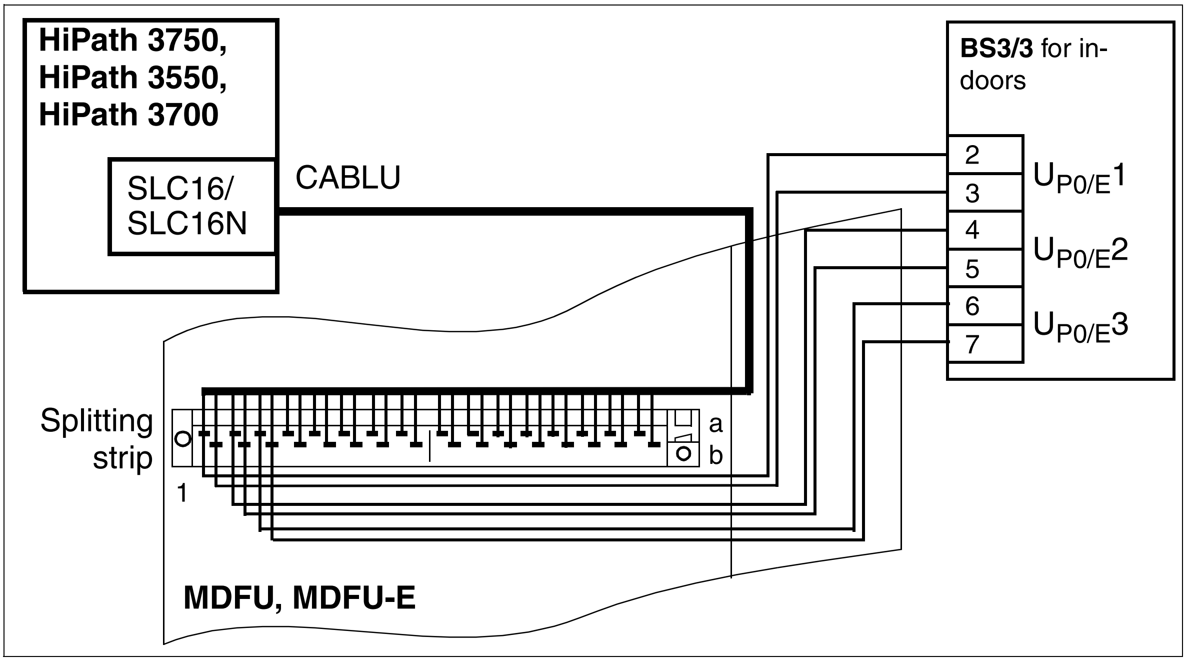


Figure 3-66 BS3/3 Power Supply via Three $U_{P0/E}$ Interfaces (Not for U.S.)

Additional UPSC-D power supply via EPSU2

If the power supplied by the UPSC-D (HiPath 3550) is insufficient, additional power can be supplied by installing the external power supply EPSU2. To do this, connect the DC port on the EPSU2 to the special DC input on the UPSC-D.

As described on the preceding pages, the base stations must be connected to one (BS3/1) or two (BS2/2 and BS3/3) or three (BS3/3) free $U_{P0/E}$ interfaces on SLC16 or SLC16N.

If you need an additional external power supply for the 19-inch housing in HiPath 3500 or HiPath 3300, you should use the EPSU2-R power supply. This is installed in the ECR expansion cabinet rack (see Section 9.2.4).

Section 11.5, “Power-Related Capacity Limits” shows which telephone configurations manage without an additional power supply and which configurations require an additional one.

EPSU2 external power supply

The EPSU2 AC/DC converter is an external power supply unit for use when the UPSC-D is unable to provide sufficient power for the base stations and telephones at the HiPath 3550.

The external power supply EPSU2 comes in two versions:

- S30122-K7221-X1 - This version is always supplied with four built-in batteries. These batteries guarantee approx. 30 minutes of bridging time in the event of a power failure.
- S30122-K7221-X2 - This version is supplied without batteries. To use this model's uninterruptible power supply function, four batteries must be ordered separately and installed.

> The new EPSU2 model S30122-K7221-X2 is designed to replace S30122-K7221-X1.
> Differences between the two models are indicated at the appropriate point in the following description.

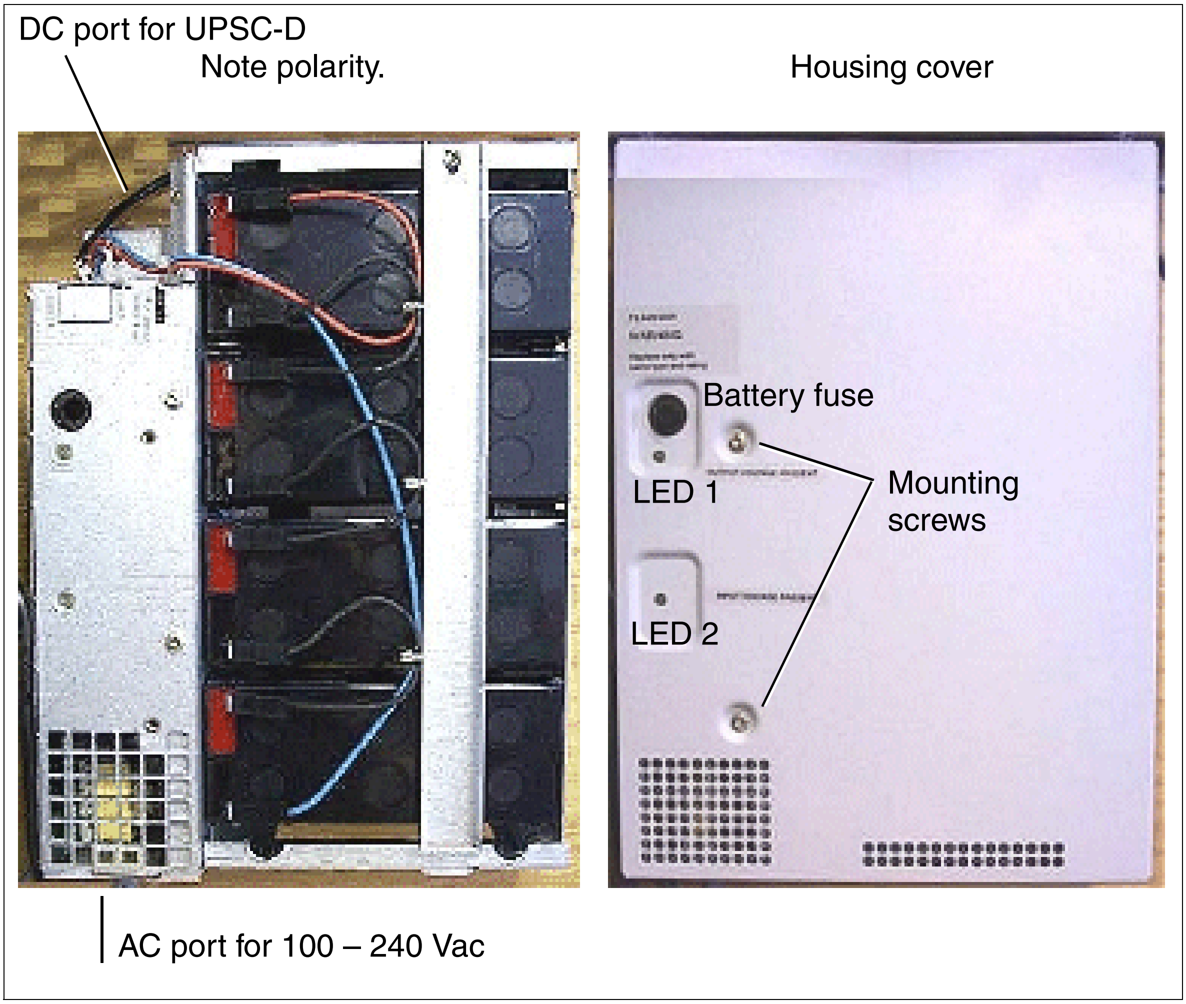

DC port for UPSC-D
Note polarity.
Housing cover
Battery fuse
LED 1
Mounting screws
LED 2
AC port for 100 – 240 Vac

Figure 3-67 EPSU2 - Indicators and Ports

Table 3-64 EPSU2 - Explanation of Indicators and Ports

LED 1 **(DC output)**	**LED 2** **(AC input)**	**Description**
On	On	DC output and AC input voltages are OK.
Off	On	No DC voltage at output (for example DC load short-circuited).
On	Off	No AC voltage at input (power outage, circuit-breaker panel receiving battery power).
Off	Off	No AC input voltage (power outage) and batteries are empty, or the battery fuse is defective or was removed (for example by turning it to the left).
Ports		**Description**
Battery fuse		Melting fuse 5 x 20 mm, 2.5 A/slow-blowing
AC port (input)		IEC 320/16 (grounding power cable/IEC)
DC port (output)		Screw terminal connections for insulated lines (0.5 – 2.5 mm^2), 56 V, 140 W ● EPSU2 S30122-K7221-X1 = 2-wire power cable to UPSC-D, pre-installed, soldered ends. Note polarity. ● EPSU2 S30122-K7221-X2 = 2-wire power cable to UPSC-D, with Phoenix terminal block.

EPSU2 technical specifications

Table 3-65 EPSU2 - Technical Specifications

	EPSU2 **S30122-K7221-X1**	**EPSU2** **S30122-K7221-X2**
Scope of delivery	● EPSU2 AC/DC converter with four UPS batteries loaded ● Operating instructions ● AC connecting cable (protective grounding plug, IEC-320 socket) ● DC cable to UPSC-D (length = 2 m)	● EPSU2 AC/DC converter without batteries ● Operating instructions ● AC connecting cable (protective grounding plug, IEC-320 socket) ● DC cable to UPSC-D (length = 2 m)
AC power cable	● C39195-Z7001-C17 Euro angled ● C39195-Z7001-C20 GBR angled	

Table 3-65 EPSU2 - Technical Specifications

	EPSU2 **S30122-K7221-X1**	**EPSU2** **S30122-K7221-X2**
AC power	100 - 240 V AC	
Frequency range	47 to 63 Hz	
Connected output	200 W	
Output power consumption/ nominal output	140 W	
Mains/nominal voltage	54.2 V	
UPS batteries	V39113-W5123-E891 Four batteries are supplied built-in.	V39113-W5123-E891 Batteries are not included in the scope of supply and must be ordered separately.
Battery operation: • Permitted batteries Manufacturer/type number • Number of batteries • Size (Ah) • Nominal voltage • Overload protection	• CSB/EVX-1270, Hitachi/HP6.5-12, Yuasa/NP6-12, Varta/ Noack 43720303, Sonnenschein/0719143200, Panasonic/ LCR12-7P • 4 units, 12 V each • 7 Ah • 48 V (fully charged 54 V, discharge to 44 V) • Melting fuse 5 x 20 mm, 2.5 A/slow-blowing	
Nominal current	2.5 A	
Overload protection	Electronic current limiting circuit	
Ambient temperature	In buildings, +5 to +45 °C (41 to 113 °F)	
Humidity	95%, non-condensing	
Cooling	Natural convection	
Protection	IP 21 (DIN 40050)	
Housing dimensions (W x D x H in mm)	250 x 114 x 317	
Weight	approx. 14.1 kg (incl. batteries)	approx. 4.1 kg (without batteries)
Symbol	CE	
Personal safety, insulation	EN60950 and IEC950	
Grounding, shielding	Protection class 1, output is floating against ground	

Installation notes

- The EPSU2 AC/DC converter is designed for installation indoors only.
- The unit is suitable only for mounting on the wall (vertically, with AC port on bottom).
- Always install the units in a dry, dust-free area where there is no danger of vibrations.
- Always make sure there is sufficient air circulation around the units. Do not block the ventilation holes.
- When selecting the location, keep in mind the necessary lengths of the following cables:
  – AC cable (grounding plug, IEC 320 socket)
  – DC cable to UPSC-D, length = 2 m

Procedure: EPSU2 wall-mounting

Step	Activity
1.	Drill two holes for anchors (5 mm in diameter) in the wall, as shown in Figure 3-68. Depending on the wall materials, you may have to use a different kind of attachment, such as wood screws for timber walls.
2.	Insert the anchors and insert two screws (3.5 mm in diameter), leaving 5 mm projecting from the wall.
3.	Mount the EPSU2 onto the screws and tighten them all the way.

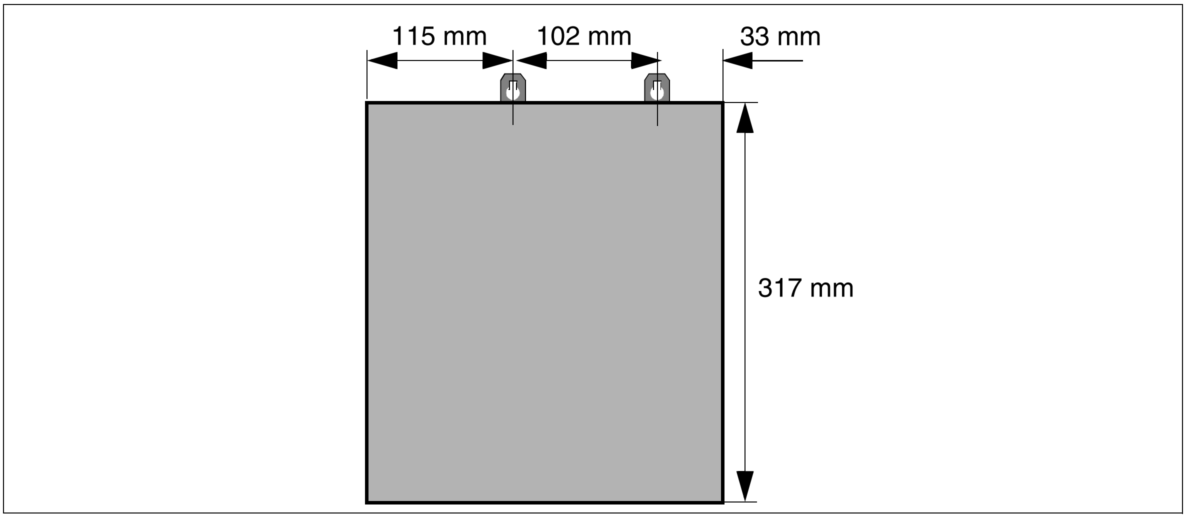


Figure 3-68 EPSU2 - Holes for Mounting on the Wall

3.3.12 SLCN (Not for U.S.)

Introduction

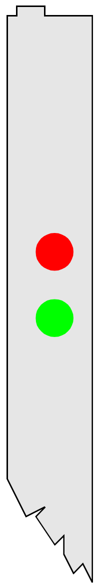
The SLCN (**S**ubscriber **L**ine Module **C**ordless **N**ew) board is used in HiPath 3800 and connects base stations to HiPath Cordless Office. There are 16 $U_{P0/E}$ ports available for this.

You can install up to four SLCN boards in one system.

Chapter 11 contains basic information on the options available for operating HiPath Cordless Office.

Base stations must be clocked with a high degree of accuracy for HiPath Cordless Office. For this, the subboard CMS must be plugged into the CBSAP board (see Table 11-1).

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-69 SLCN (S30810-Q2193-X300) - LEDs on the Front Panel

> To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

LED statuses and their meanings

Table 3-66 SLCN:LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-67
- For connecting to the connector panels using RJ45 jacks: Table 3-68
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-69

Table 3-67 SLCN - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	SLCN		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-68 SLCN - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		**SLCN**	**Notes**
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-68 SLCN - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		**SLCN**	**Notes**
No.	**Pin**		
17	4		Free
	5		
18	4		Free
	5		
19	4		Free
	5		
20	4		Free
	5		
21	4		Free
	5		
22	4		Free
	5		
23	4		Free
	5		
24	4		Free
	5		

Table 3-69 SLCN - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLCN		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

System configuration using SLCN

For information on the maximum possible system configuration of HiPath Cordless Office with the SLCN boards see Table 11-1.

SLCN board distribution in HiPath 3800 cabinets

You can install up to four SLCN boards in HiPath 3800. A system cabinet can be fitted with all four SLCN boards.

> To guarantee uninterrupted operation of the HiPath 3800, not more than two SLCN boards should be plugged in to a PCM segment. This condition must always be observed. For information on PCM segment distribution, see Section 4.2.5.6.
> One board slot should be kept free between two SCLN boards to prevent overheating.

Supplying power to base stations

Power is supplied to the base stations primarily via the internal PSU in the system in question.

If the correct number of LUNA2 modules was calculated, the system’s internal power supply unit provides sufficient power to supply the HiPath Cordless Office system configuration specified in Table 11-1.

3.3.13 SLMA, SLMA8

Introduction

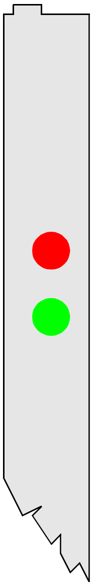
The SLMA and SLMA8 (**S**ubscriber **L**ine **M**odule **A**nalog) boards provide analog T/R interfaces for use in HiPath 3800:

- SLMA (S30810-Q2191-C300) = 24 analog T/R interfaces
- SLMA8 (S30810-Q2191-C100) = eight analog T/R interfaces

The boards generate their own ring voltages and do not require an external ring generator.

> For Australia only: The ring voltage is 35 V_{eff}. Depending on the terminals connected, we cannot exclude the possibility of errors occurring during ringing state.

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-70 SLMA/SLMA8 - LEDs on the Front Panel

> To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

LED statuses and their meanings

Table 3-70 SLMA/SLMA8 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-71
- For connecting to the connector panels using RJ45 jacks: Table 3-72
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-73
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-74 and Table 3-75

Table 3-71 SLMA/SLMA8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	SLMA, SLMA8		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	Not used in SLMA8
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-71 SLMA/SLMA8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	SLMA, SLMA8		MDFU-E	Notes
17	yel/ora		43	17a	Port 17	17a	Not used in SLMA8
		ora/yel	44	17b		17b	
18	yel/grn		45	18a	Port 18	18a	
		grn/yel	46	18b		18b	
19	yel/brn		47	19a	Port 19	19a	
		brn/yel	48	19b		19b	
20	yel/gry		49	20a	Port 20	20a	
		gry/yel	50	20b		20b	
21	vio/blu		51	21a	Port 21	21a	
		blu/vio	52	21b		21b	
22	vio/ora		53	22a	Port 22	22a	
		ora/vio	54	22b		22b	
23	vio/grn		55	23a	Port 23	23a	
		grn/vio	56	23b		23b	
24	vio/brn		57	24a	Port 24	24a	
		brn/vio	58	24b		24b	

Table 3-72 SLMA/SLMA8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA, SLMA8	Notes
No.	Pin		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	Not used for SLMA8
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-72 SLMA/SLMA8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA, SLMA8	Notes
No.	**Pin**		
17	4	17a	Not used for SLMA8
	5	17b	
18	4	18a	
	5	18b	
19	4	19a	
	5	19b	
20	4	20a	
	5	20b	
21	4	21a	
	5	21b	
22	4	22a	
	5	22b	
23	4	23a	
	5	23b	
24	4	24a	
	5	24b	

Table 3-73 SLMA/SLMA8 - Connector Panel Assignment with CHAMP Jack (For U.S. Only)

CHAMP jack	SLMA, SLMA8			Notes
1	1a	1 Ring	Port 1	
26	1b	1 TIP		
2	2a	2 Ring	Port 2	
27	2b	2 TIP		
3	3a	3 Ring	Port 3	
28	3b	3 TIP		
4	4a	4 Ring	Port 4	
29	4b	4 TIP		
5	5a	5 Ring	Port 5	
30	5b	5 TIP		
6	6a	6 Ring	Port 6	
31	6b	6 TIP		
7	7a	7 Ring	Port 7	
32	7b	7 TIP		
8	8a	8 Ring	Port 8	
33	8b	8 TIP		
9	9a	9 Ring	Port 9	Not used in SLMA8
34	9b	9 TIP		
10	10a	10 Ring	Port 10	
35	10b	10 TIP		
11	11a	11 Ring	Port 11	
36	11b	11 TIP		
12	12a	12 Ring	Port 12	
37	12b	12 TIP		
13	13a	13 Ring	Port 13	
38	13b	13 TIP		
14	14a	14 Ring	Port 14	
39	14b	14 TIP		
15	15a	15 Ring	Port 15	
40	15b	15 TIP		
16	16a	16 Ring	Port 16	
41	16b	16 TIP		

Table 3-73 SLMA/SLMA8 - Connector Panel Assignment with CHAMP Jack (For U.S. Only)

CHAMP jack	SLMA, SLMA8			Notes
17	17a	17 Ring	Port 17	Not used in SLMA8
42	17b	17 TIP		
18	18a	18 Ring	Port 18	
43	18b	18 TIP		
19	19a	19 Ring	Port 19	
44	19b	19 TIP		
20	20a	20 Ring	Port 20	
45	20b	20 TIP		
21	21a	21 Ring	Port 21	
46	21b	21 TIP		
22	22a	22 Ring	Port 22	
47	22b	22 TIP		
23	23a	23 Ring	Port 23	
48	23b	23 TIP		
24	24a	24 Ring	Port 24	
49	24b	24 TIP		

Table 3-74 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLMA, SLMA8		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	Not used in SLMA8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

Table 3-75 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 17 - 24)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLMA, SLMA8		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	Not used in SLMA8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

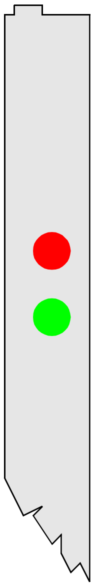
3.3.14 SLMO2, SLMO8

Introduction

The SLMO2 and SLMO8 boards (**S**ubscriber **L**ine **M**odule **O**ptiset) provide $U_{P0/E}$ interfaces for use in HiPath 3800:

- SLMO2 (S30810-Q2168-X10) = 24 $U_{P0/E}$ interfaces
- SLMO8 (S30810-Q2168-X100) = eight $U_{P0/E}$ interfaces

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-71 SLMO2/SLMO8 - LEDs on the Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

LED statuses and their meanings

Table 3-76 SLMO2 and SLMO8 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-77
- For connecting to the connector panels using RJ45 jacks: Table 3-78
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-79
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-80 and Table 3-81

Table 3-77 SLMO2/SLMO8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	SLMO2, SLMO8		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	Not used in SLMO8
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-77 SLMO2/SLMO8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	SLMO2, SLMO8		MDFU-E	Notes
17	yel/ora		43	17a	Port 17	17a	Not used in SLMO8
		ora/yel	44	17b		17b	
18	yel/grn		45	18a	Port 18	18a	
		grn/yel	46	18b		18b	
19	yel/brn		47	19a	Port 19	19a	
		brn/yel	48	19b		19b	
20	yel/gry		49	20a	Port 20	20a	
		gry/yel	50	20b		20b	
21	vio/blu		51	21a	Port 21	21a	
		blu/vio	52	21b		21b	
22	vio/ora		53	22a	Port 22	22a	
		ora/vio	54	22b		22b	
23	vio/grn		55	23a	Port 23	23a	
		grn/vio	56	23b		23b	
24	vio/brn		57	24a	Port 24	24a	
		brn/vio	58	24b		24b	

Table 3-78 SLMO2/SLMO8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		**SLMO2, SLMO8**	**Notes**
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	Not used for SLMO8
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-78 SLMO2/SLMO8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		**SLMO2, SLMO8**	**Notes**
No.	**Pin**		
17	4	17a	Not used for SLMO8
	5	17b	
18	4	18a	
	5	18b	
19	4	19a	
	5	19b	
20	4	20a	
	5	20b	
21	4	21a	
	5	21b	
22	4	22a	
	5	22b	
23	4	23a	
	5	23b	
24	4	24a	
	5	24b	

Table 3-79 SLMO2/SLMO8 - Connector Panel Assignment with CHAMP Jack (For U.S. Only)

CHAMP jack	SLMO2, SLMO8			Notes
1	1a	1 Ring	Port 1	
26	1b	1 TIP		
2	2a	2 Ring	Port 2	
27	2b	2 TIP		
3	3a	3 Ring	Port 3	
28	3b	3 TIP		
4	4a	4 Ring	Port 4	
29	4b	4 TIP		
5	5a	5 Ring	Port 5	
30	5b	5 TIP		
6	6a	Ring	Port 6	
31	6b	6 TIP		
7	7a	7 Ring	Port 7	
32	7b	7 TIP		
8	8a	8 Ring	Port 8	
33	8b	8 TIP		
9	9a	9 Ring	Port 9	Not used for SLMO8
34	9b	9 TIP		
10	10a	10 Ring	Port 10	
35	10b	10 TIP		
11	11a	11 Ring	Port 11	
36	11b	11 TIP		
12	12a	12 Ring	Port 12	
37	12b	12 TIP		
13	13a	13 Ring	Port 13	
38	13b	13 TIP		
14	14a	14 Ring	Port 14	
39	14b	14 TIP		
15	15a	15 Ring	Port 15	
40	15b	15 TIP		
16	16a	16 Ring	Port 16	
41	16b	16 TIP		

Table 3-79 SLMO2/SLMO8 - Connector Panel Assignment with CHAMP Jack (For U.S. Only)

CHAMP jack	SLMO2, SLMO8			Notes
17	17a	17 Ring	Port 17	Not used for SLMO8
42	17b	17 TIP		
18	18a	18 Ring	Port 18	
43	18b	18 TIP		
19	19a	19 Ring	Port 19	
44	19b	19 TIP		
20	20a	20 Ring	Port 20	
45	20b	20 TIP		
21	21a	21 Ring	Port 21	
46	21b	21 TIP		
22	22a	22 Ring	Port 22	
47	22b	22 TIP		
23	23a	23 Ring	Port 23	
48	23b	23 TIP		
24	24a	24 Ring	Port 24	
49	24b	24 TIP		

Table 3-80 SLMO2/SLMO8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLMO2, SLMO8		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	Not used in SLMO8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

Table 3-81 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 17 - 24)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLMA, SLMA8		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	Not used in SLMO8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

3.3.15 SLMO8 (Not for U.S.), SLMO24

Introduction

The SLMO8 and SLMO24 (**S**ubscriber **L**ine **M**odule Cost **O**ptimized $U_{P0/E}$) boards provide 8 and 24 connections for connecting optiset E and optiPoint 500 telephones to HiPath 3750, HiPath 3550 and HiPath 3700.

Switches and LEDs

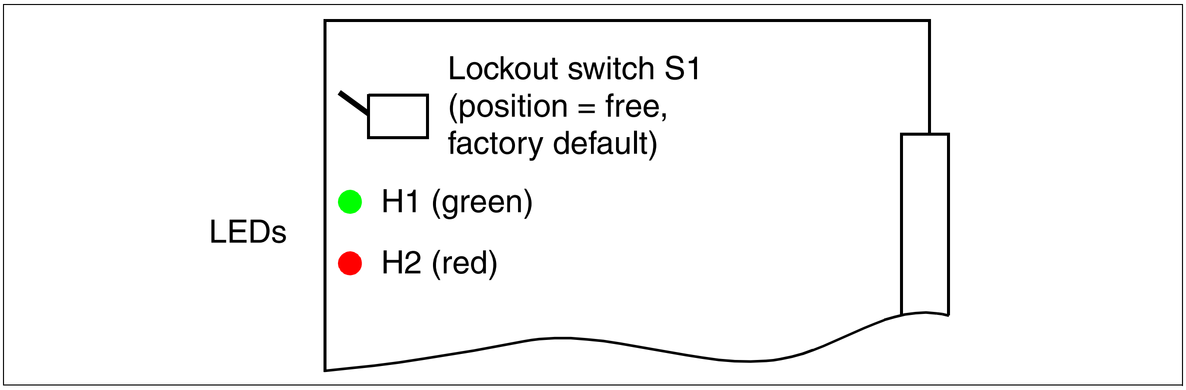

Lockout switch S1
(position = free,
factory default)
LEDs
H1 (green)
H2 (red)

Figure 3-72 SLMO8 (Not for U.S.), SLMO24 (S30810-Q2901-X100, S30810-Q2901-X)

LED statuses and their meanings

Table 3-82 SLMO8 (Not for U.S.) and SLMO24 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-83 SLMO8 (Not for U.S.), SLMO24 - Cable 1 Assignment (SU Xx8)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLMO8, SLMO24		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes
				BP: Xx8					
1	1	wht/blu		19	1a	Access 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Access 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Access 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Access 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Access 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Access 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Access 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Access 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Access 9	9a	4	Not used in SLMO8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Access 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Access 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Access 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Access 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Access 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Access 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Access 16	16a	4	
			blu/yel	28	16b		16b	5	

Table 3-84 SLMO8 (Not for U.S.), SLMO24 - Cable 2 Assignment (SU Xx9)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	SLMO8, SLMO24		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes
				BP: Xx9					
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Access 17	17a	4	Not used in SLMO8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Access 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Access 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Access 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Access 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Access 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Access 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Access 24	24a	4	
			blu/yel	28	24b		24b	5	

Table 3-85 SLMO24 - Assignment (SU Xx8, Xx9) (For U.S. Only)

#	a-Wire (Tip)	b-Wire (Ring)	SU connector		SLMO24		CHAMP jack, MDF		Notes
			BP: Xx8	BP: Xx9					
1	wht/blu		19		1a	Port 1	1	1a	
		blu/wht	39		1b		26	1b	
2	wht/ora		38		2a	Port 2	2	2a	
		ora/wht	48		2b		27	2b	
3	wht/grn		27		3a	Port 3	3	3a	
		grn/wht	47		3b		28	3b	
4	wht/brn		16		4a	Port 4	4	4a	
		brn/wht	46		4b		29	4b	
5	wht/gry		05		5a	Port 5	5	5a	
		gry/wht	45		5b		30	5b	
6	red/blu		14		6a	Port 6	6	6a	
		blu/red	44		6b		31	6b	
7	red/ora		23		7a	Port 7	7	7a	
		ora/red	43		7b		32	7b	
8	red/grn		32		8a	Port 8	8	8a	
		grn/red	42		8b		33	8b	
9	red/brn		11		9a	Port 9	9	9a	
		brn/red	31		9b		34	9b	
10	red/gry		02		10a	Port 10	10	10a	
		gry/red	22		10b		35	10b	
11	blk/blu		13		11a	Port 11	11	11a	
		blu/blk	33		11b		36	11b	
12	blk/ora		04		12a	Port 12	12	12a	
		ora/blk	24		12b		37	12b	
13	blk/grn		15		13a	Port 13	13	13a	
		grn/blk	35		13b		38	13b	
14	blk/brn		06		14a	Port 14	14	14a	
		brn/blk	26		14b		39	14b	
15	blk/gry		17		15a	Port 15	15	15a	
		gry/blk	37		15b		40	15b	
16	yel/blu		08		16a	Port 16	16	16a	
		blu/yel	28		16b		41	16b	

Table 3-85 SLMO24 - Assignment (SU Xx8, Xx9) (For U.S. Only)

#	a-Wire (Tip)	b-Wire (Ring)	SU connector		SLMO24		CHAMP jack, MDF		Notes
			BP: Xx8	BP: Xx9					
17	red/brn			11	17a	Port 17	9	9a	
		brn/red		31	17b		34	9b	
18	red/gry			02	18a	Port 18	10	10a	
		gry/red		22	18b		35	10b	
19	blk/blu			13	19a	Port 19	11	11a	
		blu/blk		33	19b		36	11b	
20	blk/ora			04	20a	Port 20	12	12a	
		ora/blk		24	20b		37	12b	
21	blk/grn			15	21a	Port 21	13	13a	
		grn/blk		35	21b		38	13b	
22	blk/brn			06	22a	Port 22	14	14a	
		brn/blk		26	22b		39	14b	
23	blk/gry			17	23a	Port 23	15	15a	
		gry/blk		37	23b		40	15b	
24	yel/blu			08	24a	Port 24	16	16a	
		blu/yel		28	24b		41	16b	

3.3.16 SLU8

Introduction

The SLU8 board for HiPath 3550 and HiPath 3350 (wall housing) with 8 digital subscriber line interfaces allows up to 16 digital telephones to be connected in host-client operation (master-slave operation).

Interfaces

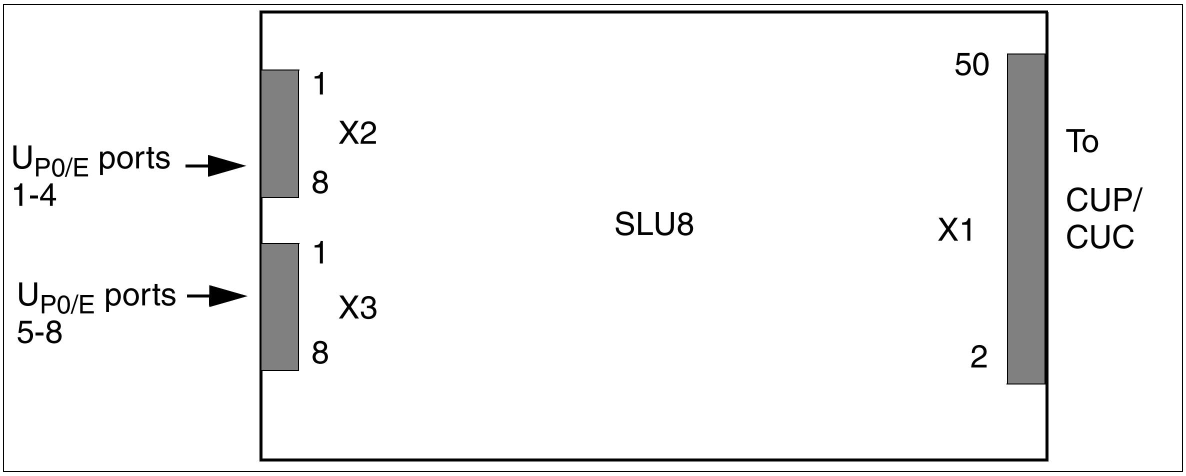


Figure 3-73 SLU8 Interfaces (S30817-Q922-A301)

Caution
After deactivating the power supply, you must wait a short while before plugging the SLU8 in or out. If you do not wait before doing so, the CBCC/CBCP may be damaged.

Table 3-86 SLU8 Contact Assignments

Contact	X2 ($U_{Po/E}$ ports 1-4)	X3 ($U_{P0/E}$ ports 5-8)
1	a 1	a 5
2	b 1	b 5
3	a 2	a 6
4	b 2	b 6
5	a 3	a 7
6	b 3	b 7
7	a 4	a 8
8	b 4	b 8

3.3.17 SLU8R

Introduction

The SLU8R (**S**ubscriber **L**ine $\mathbf{U_{P0/E}}$ **R**ack) boards provide eight ports for connecting optiset E and optiPoint 500 telephones to HiPath 3500 and HiPath 3300 (19-inch housing).

Interfaces

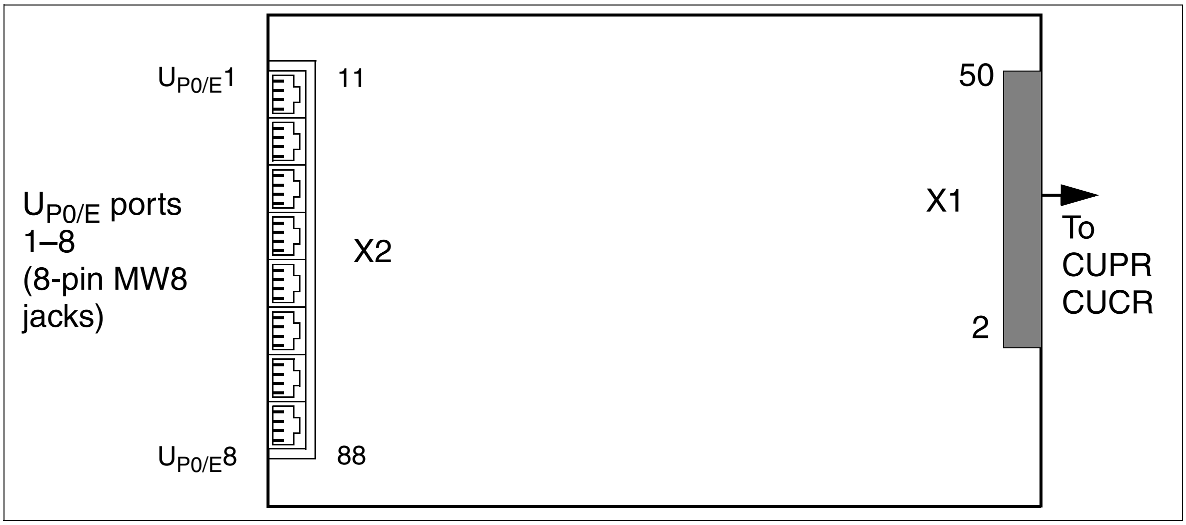

$U_{P0/E}1$
11
$U_{P0/E}$ ports 1–8 (8-pin MW8 jacks)
X2
$U_{P0/E}8$
88
50
X1
2
To CUPR CUCR

Figure 3-74 SLU8R Interfaces (S30817-K922-Z301)

Table 3-87 SLU8R Contact Assignments

MW8 jack	X2, pin	$U_{P0/E}$ ports 1 - 4	MW8 jack	X2, pin	$U_{P0/E}$ ports 5 - 8
1	14	a 1	5	54	a 5
	15	b 1		55	b 5
2	24	a 2	6	64	a 6
	25	b 2		65	b 6
3	34	a 3	7	74	a 7
	35	b 3		75	b 7
4	44	a 4	8	84	a 8
	45	b 4		85	b 8

3.3.18 STLS2 (Not for U.S.), STLS4

Introduction

The STLS4 board for HiPath 3550 and HiPath 3350 (wall housing) has four S_0 ports that can operate as trunk interfaces or as subscriber line interfaces (see Page 3-193).

The STLS2 is an underequipped variant with two S_0 ports.

Interfaces

> The board does **not** supply terminals with power. Power must be supplied locally using a local plug-in power supply or a bus power supply unit, for example.

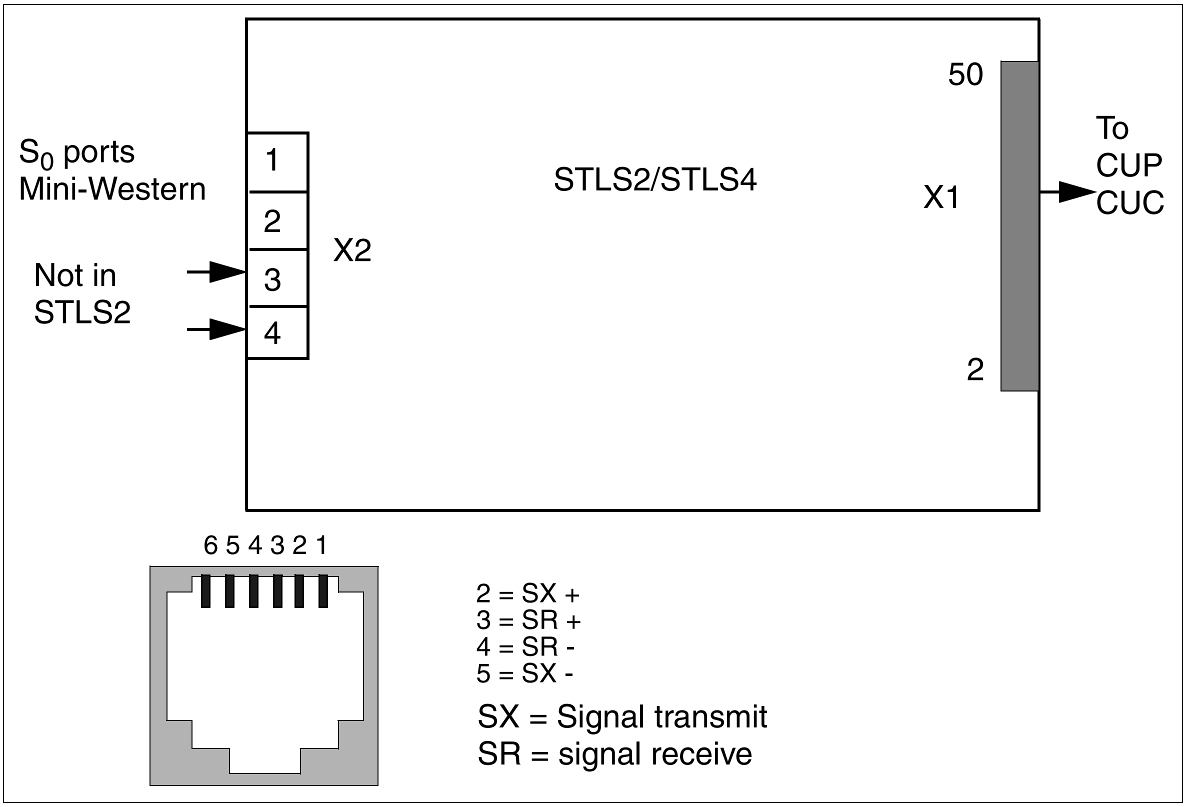

S0 ports
Mini-Western
Not in
STLS2
1
2
3
4
X2
STLS2/STLS4
50
X1
2
To
CUP
CUC
6 5 4 3 2 1
2 = SX +
3 = SR +
4 = SR -
5 = SX -
SX = Signal transmit
SR = signal receive

Figure 3-75 STLS2 (Not for U.S.), STLS4 Interfaces (S30817-Q924-B313, -A313)

Interface Assignments (for U.S. only)

Table 3-88 STLS4 Module Interface Assignments (For U.S. Only)

Pin	Port	Assignment		Pin	Port	Assignment
2	1	Signal transmit		2	3	Signal transmit
3		Signal receive		3		Signal receive
4		Signal receive		4		Signal receive
5		Signal transmit		5		Signal transmit
2	2	Signal transmit		2	4	Signal transmit
3		Signal receive		3		Signal receive
4		Signal receive		4		Signal receive
5		Signal transmit		5		Signal transmit

Note: The STLS4 module supports the trunk side in Europe, so the transmit and receive signals must be reversed before the first device on the S_0 bus. In contrast, the optiset E ISDN adapter uses a straight-through connection because it is always a station-only device. For information, see Figure 3-79.

The ISDN terminals must have their own local power supply.

The system assigns the MSN only after the S_0 port is configured on the "Euro bus" (not for U.S.) and can be read out via the administration (Assistant T: Code 20 4 3 S_0 Bus MSN).

Connecting ISDN (S_0) interfaces (not for U.S.)

You can use the MW jacks on the STLS boards to connect between one and four ISDN S_0 buses. The interfaces on the STLS boards are freely configurable.

- EURO CO point-to-point
- EURO CO point-to-multipoint
- EURO bus
- CorNet N/CorNet NQ slave
- Using HiPath 3000 Manager E, you can also set up configurations for networking and dedicated lines

Use the S_0 interface $S_0$1 for connection to the public telecommunications network (ISDN trunk).

You can also connect S_0 interfaces $S_0$2 to $S_0$4 to the ISDN trunk or to ISDN terminals (ISDN telephone, group 4 fax device, PC, dialing aid) via an S_0 bus.

The connection (networking) to HiPath 3000 and HiPath 4000 (CorNet NQ) can also be set up via S_0 interfaces $S_0$1 to $S_0$4.

S_0 connection options:

- Point-to-point (PP) (default)
- Point-to-multipoint (PMP)

Connecting an ISDN trunk (not for U.S.)

Insert the connection cable supplied in jacks $S_0$1 to $S_0$4. Insert the other end in the NT of the carrier.

Networking connection (HiPath 4000/CorNet NQ (not for U.S.)

Insert the connection cable supplied in jacks $S_0$1 to $S_0$4. Connect the other end with the HiPath 4000 port.

Connecting ISDN terminals (not for U.S.)

Depending on the system, you can set up a maximum of four internal S_0 buses ($S_0$1 to $S_0$4). A maximum of eight ISDN terminals can be addressed on each S_0 bus.

The system does not assign the MSN until the S_0 port is configured on the “Euro bus”; the MSN can be read out via administration.

When you set up an S_0 bus, it is assigned an MSN. This MSN is the first free station number in the system. The S_0 station is immediately available under this MSN, without an outgoing seizure.

> If no MSN is entered in the terminal, a default MSN is automatically assigned after you change the S_0 port to "Euro bus" in system administration.

Configuring an S_0 bus with a Mini-Western jack (not for U.S.)

S_0 telephones cannot be directly connected to an STLS board’s Mini-Western jack via the cable supplied. You must first install a jack with cross-connected cables (see Figure 3-77).

Assignment of MW jack pins 1- 8:

8-pin

8	7	6	5	4	3	2	1
		SR	SX	SX	SR		

6-pin

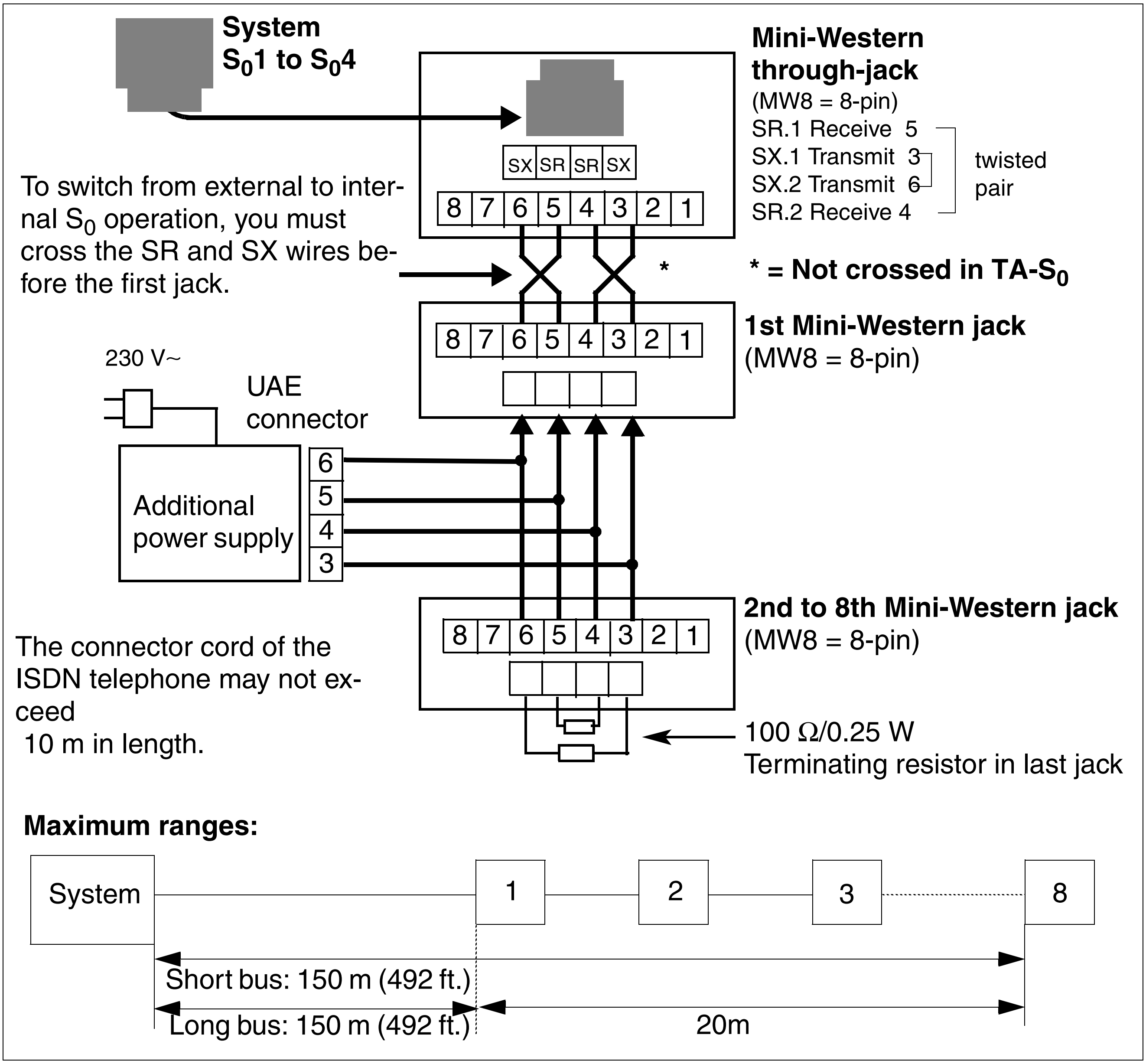
6	5	4	3	2	1
	SR	SX	SX	SR	

4-pin

4	3	2	1
SR	SX	SX	SR

Always establish contact on the center four pins.

Figure 3-76 Sample Pin Assignments in MW Jacks (Not for U.S.)


System
$S_0$1 to $S_0$4
Mini-Western
through-jack
(MW8 = 8-pin)
SR.1 Receive 5
SX.1 Transmit 3
SX.2 Transmit 6
SR.2 Receive 4
twisted
pair
SX SR SR SX
8 7 6 5 4 3 2 1
*
*** = Not crossed in TA-S_0**
1st Mini-Western jack
(MW8 = 8-pin)
8 7 6 5 4 3 2 1
230 V~
UAE
connector
Additional
power supply
6
5
4
3
2nd to 8th Mini-Western jack
(MW8 = 8-pin)
8 7 6 5 4 3 2 1
100 Ω/0.25 W
Terminating resistor in last jack
Maximum ranges:
System
1
2
3
8
Short bus: 150 m (492 ft.)
Long bus: 150 m (492 ft.)
20m

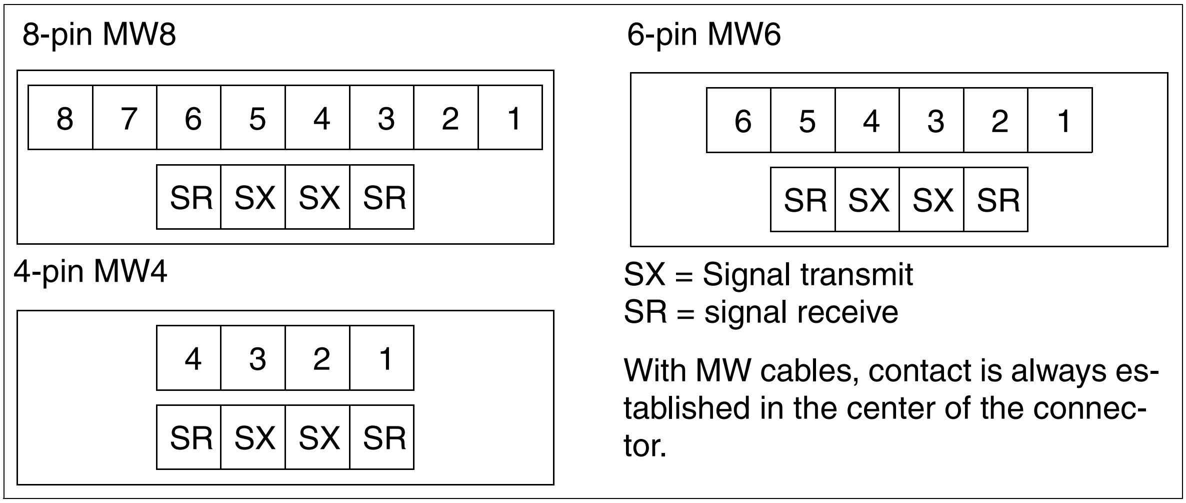
To switch from external to internal S_0 operation, you must cross the SR and SX wires before the first jack.

The connector cord of the ISDN telephone may not exceed 10 m in length.

Figure 3-77 Wiring and Ranges for S_0 Bus Jacks (Not for U.S.)

Connecting ISDN Terminals to HiPath 3550 and HiPath 3350 (for U.S. only)

- S_0 Bus With MW8 jack, connecting $S_0$1 to $S_0$4:
  - Connect the provided, silver-satin connector cord to each port on the STLS4 Module. Connect the other end to a mounted MW jack, reversing the transmit and receive wires as shown in Figure 3-79.
  - Contact is always established using the center pins of MW jacks. Figure 3-78 shows the pin assignments for jacks of different sizes.
  - The ISDN terminals must have their own local power supply.
  - Plug the ISDN terminal (connecting cord) into the MW jack. Connecting an ISDN S_0 telephone requires a local power supply (e.g. manufactured by Sedlbauer).
- Pin Assignment of MW Jacks



SX = Signal transmit
SR = signal receive

With MW cables, contact is always established in the center of the connector.

Figure 3-78 MWxx Jack Pin Assignment (For U.S. Only)

S_0 Bus wiring from STLS4 port or optiset E ISDN adapter (for U.S. only)

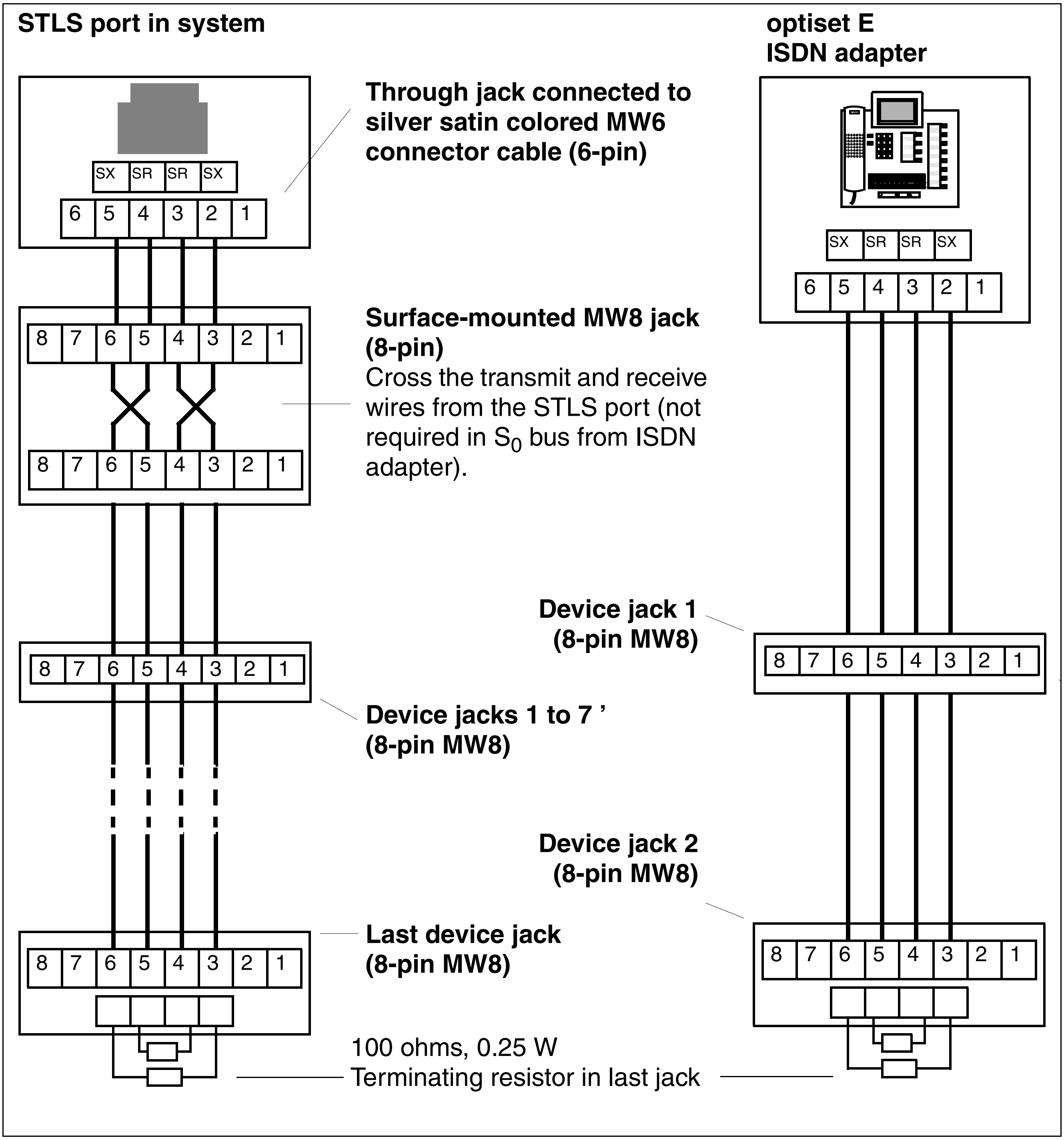

STLS port in system
optiset E ISDN adapter
Through jack connected to silver satin colored MW6 connector cable (6-pin)
SX SR SR SX
6 5 4 3 2 1
Surface-mounted MW8 jack (8-pin)
Cross the transmit and receive wires from the STLS port (not required in S0 bus from ISDN adapter).
8 7 6 5 4 3 2 1
Device jack 1 (8-pin MW8)
Device jacks 1 to 7 ’ (8-pin MW8)
Device jack 2 (8-pin MW8)
Last device jack (8-pin MW8)
100 ohms, 0.25 W
Terminating resistor in last jack

Figure 3-79 S_0 Bus Wiring from STLS4 Port or optiset E ISDN Adapter (For U.S. Only)

3.3.19 STLS4R

Introduction

The STLS4R (**S**ubscriber And **T**runk **L**ine **S$_0$** **R**ACK) board provides four S$_0$ basic rate accesses for HiPath 3500 and HiPath 3300 (19-inch housing). These are operated either as external trunk interfaces in TE (terminal equipment) mode or as internal S$_0$ buses (PMP bus) in NT (network terminator) mode with cross-connected RX-TX lines.

> The board does **not** supply terminals with power; In this case, power must be supplied locally using a local plug-in power supply or a bus power supply unit, for example.

Interfaces

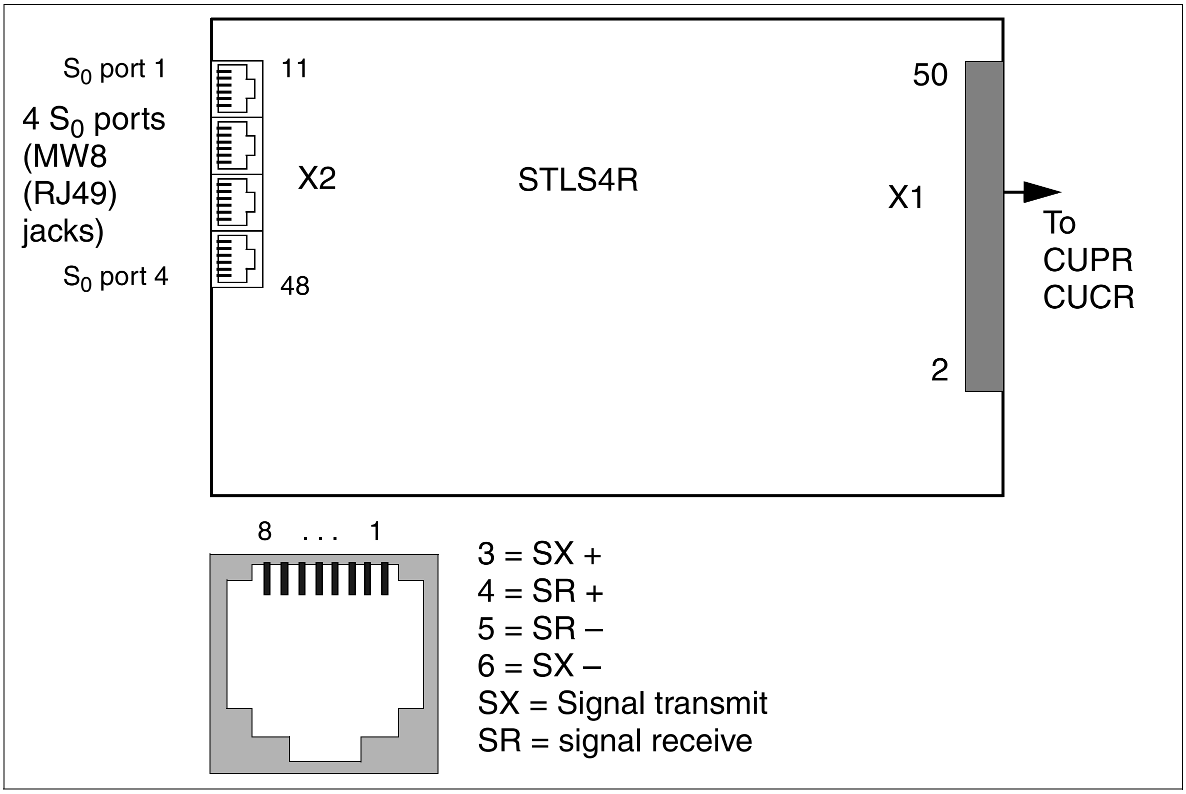

S$_0$ port 1
4 S$_0$ ports (MW8 (RJ49) jacks)
S$_0$ port 4
11
48
X2
STLS4R
50
X1
2
To CUPR CUCR
8 . . . 1
3 = SX +
4 = SR +
5 = SR –
6 = SX –
SX = Signal transmit
SR = signal receive

Figure 3-80 STLS4R Interfaces (S30817-K924-Z313)

Table 3-89 STLS4R Contact Assignments

MW8 (RJ49) Jack	X2, pin	S_0 Ports 1-4
1	13	S_0 port 1 transmit+
	14	S_0 port 1 receive+
	15	S_0 port 1 receive–
	16	S_0 port 1 transmit–
2	23	S_0 port 2 transmit+
	24	S_0 port 2 receive+
	25	S_0 port 2 receive–
	26	S_0 port 2 transmit–
3	33	S_0 port 3 transmit+
	34	S_0 port 3 receive+
	35	S_0 port 3 receive–
	36	S_0 port 3 transmit–
4	43	S_0 port 4 transmit+
	44	S_0 port 4 receive+
	45	S_0 port 4 receive–
	46	S_0 port 4 transmit–

Refer to Page 3-193 for information on connecting ISDN lines and telephones.

3.3.20 STLSX2, STLSX4, STLSX4R

Introduction

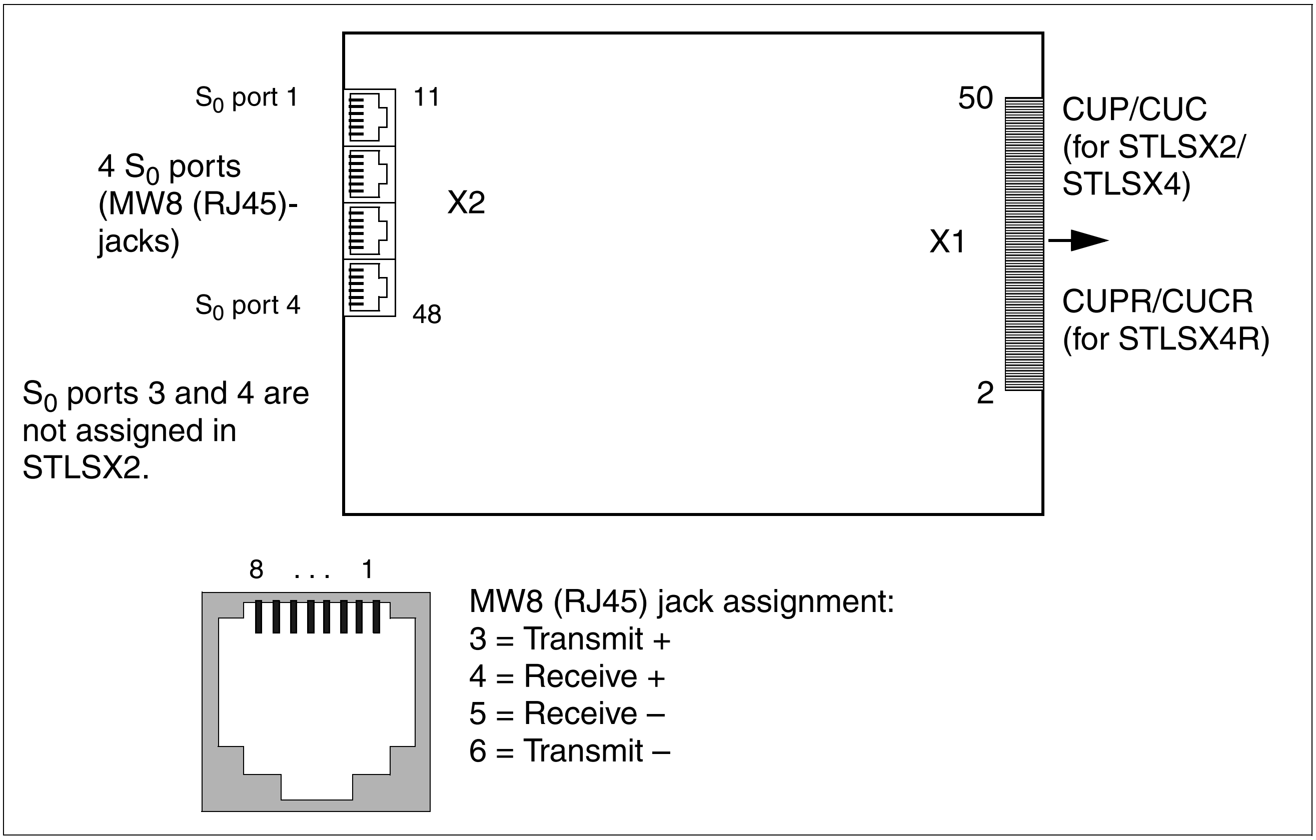
The following boards provide S_0 basic connections:

- STLSX4 (**S**ubscriber **T**runk **L**ine **S_0** with ISAC-S**X**) S30810-Q2944-X = four S_0 basic rate accesses for use in HiPath 3550 and HiPath 3350.
- STLSX2 S30810-Q2944-X100 = two S_0 basic rate accesses for use in HiPath 3550 and HiPath 3350.
- STLSX4R (**S**ubscriber **T**runk **L**ine **S_0** with ISAC-S**X** **R**ack) S30810-K2944-Z = four S_0 basic rate accesses for use in HiPath 3500 and HiPath 3300.

These are operated either as external trunk interfaces in TE (terminal equipment) mode or as internal S_0 buses (PMP bus) in NT (network terminator) mode with cross-connected RX-TX lines.

Interfaces

> The board does **not** supply terminals with power. Power must be supplied locally for telephones, for example, via a plug-in power supply unit.


S_0 port 1
4 S_0 ports (MW8 (RJ45)-jacks)
S_0 port 4
S_0 ports 3 and 4 are not assigned in STLSX2.
11
X2
48
50
X1
2
CUP/CUC (for STLSX2/ STLSX4)
CUPR/CUCR (for STLSX4R)
8 . . . 1

MW8 (RJ45) jack assignment:
3 = Transmit +
4 = Receive +
5 = Receive –
6 = Transmit –

Figure 3-81 STLSX2/STLSX4/STLSX4R - Interfaces

S_0 interface assignment

Table 3-90 STLSX2/STLSX4/STLSX4R - S_0 Interface Assignment

X2 Pin	S_0 port 1	X2 Pin	S_0 port 2	X2 Pin	S_0 port 3[1]	X2 Pin	S_0 port 4[1]
11	–	21	–	31	–	41	–
12	–	22	–	32	–	42	–
13	Transmit +	23	Transmit +	33	Transmit +	43	Transmit +
14	Receive +	24	Receive +	34	Receive +	44	Receive +
15	Receive –	25	Receive –	35	Receive –	45	Receive –
16	Transmit –	26	Transmit –	36	Transmit –	46	Transmit –
17	–	27	–	37	–	47	–
18	–	28	–	38	–	48	–

---

[1] Not for STLSX2

Configuring S_0 interfaces

Depending on how the interfaces are applied, use HiPath 3000 Manager E to define the relevant protocols for the trunks to be connected. Please note the additional information contained in the protocol templates when selecting a suitable S_0 protocol:

- CO = Interfaces to the public CO
- Bus = Interfaces to an internal station
- Master = Interfaces for a master system network
- Slave = Interfaces for a slave system network
- H150/H118 or H300 = Defines the CorNet protocol:
  - H150/H118 = Optimized for interconnection with HiPath 3000
    This option should also be selected in connection with HiPath ProCenter Office HPCO.
  - H300 = Optimized for interconnection with HiPath 4000
- Direct or fixed connection: defines the type of connection for a network and controls the supply of clock pulses:
  - Direct = Communication systems are connected to one another by means of a direct cable connection. The master system supplies the reference clock pulse for the networked system.
  - Fixed connection = Communication systems are connected over lines leased from a network provider (with clock pulse supply). The master system receives the reference clock pulse from the network.

  A slave system always receives the clock pulse from the master system regardless of whether the connection is direct or fixed.

Use the S_0 interface S_0 1 for connection to the public telecommunications network. You can also connect S_0 interfaces S_0 2 to S_0 4 to the ISDN trunk or to ISDN terminals (ISDN telephone, group 4 fax device, PC, dialing aid) via an S_0 bus.

Connecting ISDN telephones

Depending on the system, you can set up a maximum of four internal S_0 buses (S_0 1 to S_0 4). A maximum of eight ISDN terminals can be addressed on each S_0 bus.

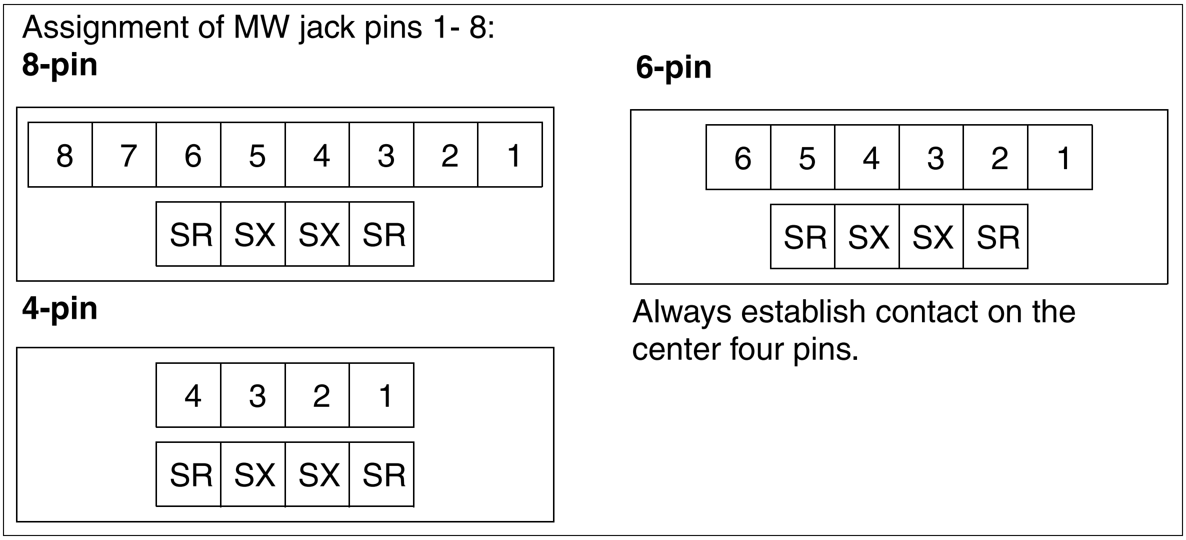
The system does not assign the MSN until the S_0 port is configured on the “Euro bus”; the MSN can be read out via administration.

When you set up an S_0 bus, it is assigned an MSN. This MSN is the first free station number in the system. The S_0 station is immediately available under this MSN, without an outgoing seizure.

> If no MSN is entered in the terminal, a default MSN is automatically assigned after you change the S_0 port to "Euro bus" in system administration.

Configuring an S_0 bus with a Mini-Western jack

S_0 telephones cannot be directly connected to an STLSX board’s Mini-Western jack via the cable supplied. You must first install a jack with cross-connected cables (see Figure 3-77).



Assignment of MW jack pins 1- 8:

8-pin

8	7	6	5	4	3	2	1
		SR	SX	SX	SR		

6-pin

6	5	4	3	2	1
	SR	SX	SX	SR	

Always establish contact on the center four pins.

4-pin

4	3	2	1
SR	SX	SX	SR

Figure 3-82 Pin Assignments in MW Jacks

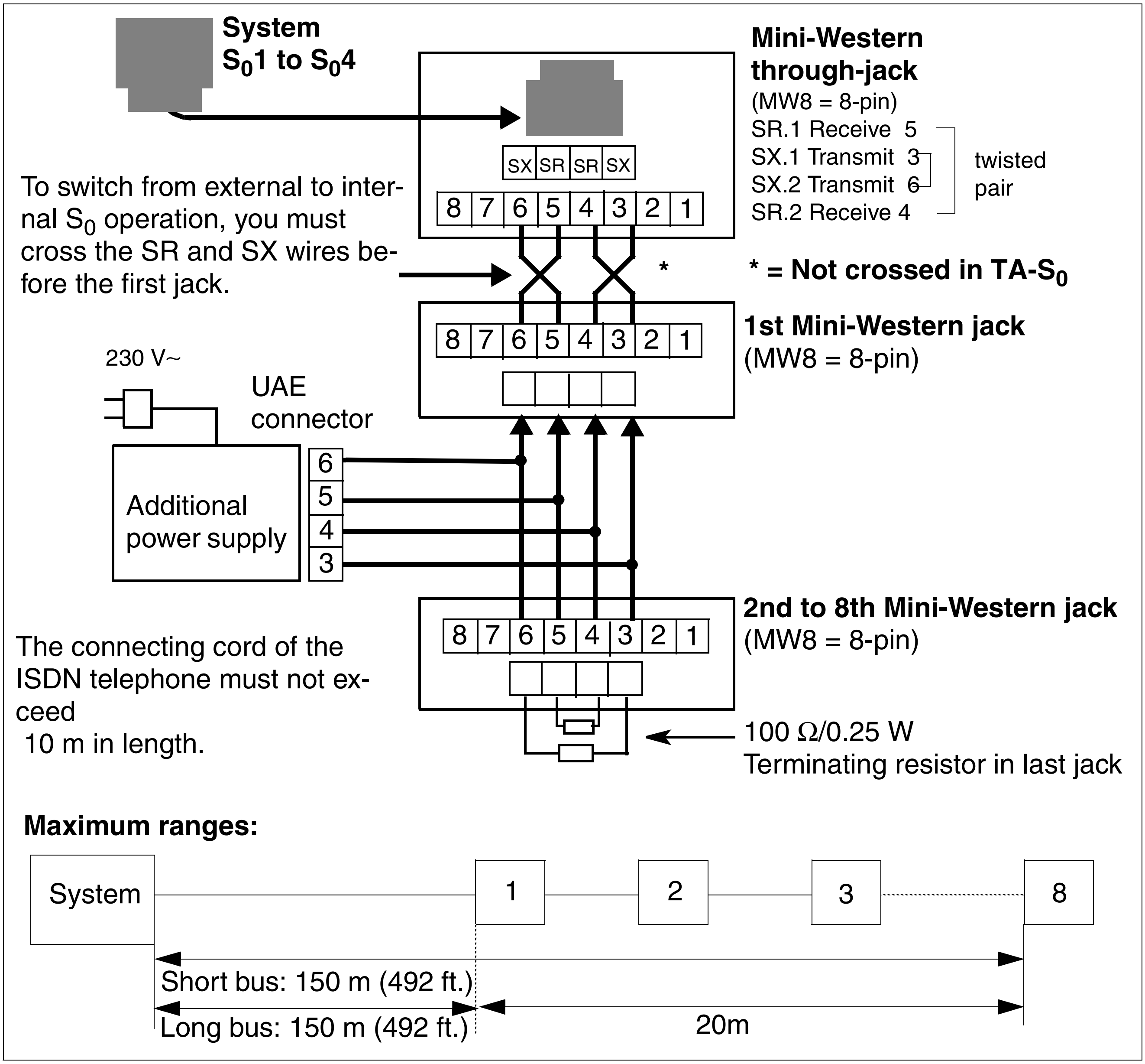

System
$S_0$1 to $S_0$4
Mini-Western
through-jack
(MW8 = 8-pin)
SR.1 Receive 5
SX.1 Transmit 3
SX.2 Transmit 6
SR.2 Receive 4
twisted
pair
SX SR SR SX
8 7 6 5 4 3 2 1
To switch from external to internal S_0 operation, you must cross the SR and SX wires before the first jack.
*
* = Not crossed in TA-S_0
1st Mini-Western jack
(MW8 = 8-pin)
230 V~
UAE
connector
Additional
power supply
6
5
4
3
2nd to 8th Mini-Western jack
(MW8 = 8-pin)
The connecting cord of the ISDN telephone must not exceed 10 m in length.
100 Ω/0.25 W
Terminating resistor in last jack
Maximum ranges:
System
1
2
3
8
Short bus: 150 m (492 ft.)
Long bus: 150 m (492 ft.)
20m

Figure 3-83 Wiring and Ranges for S_0 Bus Jacks

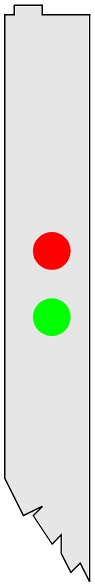
3.3.21 STMD3

Introduction

The STMD3 board (**S**ubscriber and **T**runk **M**odule **D**igital S_0) provides eight S_0 basic rate accesses for HiPath 3800 and comes in the following variants:

- S30810-Q2217-X10 = S_0 interfaces with no power supply
- S30810-Q2217-X110 = S_0 interfaces with power supply

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-84 STMD3 (S30810-Q2217-X10/-X110) - LEDs on the Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

LED statuses and their meanings

Table 3-91 STMD3 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one channel is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-92
- For connecting to the connector panels using RJ45 jacks: Table 3-93
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-94
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-95

Table 3-92 STMD3 - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	STMD3		MDFU-E	Notes
1	wht/blu		1	1Ea	Basic rate access 1	1a	
		blu/wht	23	1Eb		1b	
2	wht/ora		3	1Sa		2a	
		ora/wht	4	1Sb		2b	
3	wht/grn		5	2Ea	Basic rate access 2	3a	
		grn/wht	6	2Eb		3b	
4	wht/brn		7	2Sa		4a	
		brn/wht	8	2Sb		4b	
5	wht/gry		9	3Ea	Basic rate access 3	5a	
		gry/wht	10	3Eb		5b	
6	red/blu		11	3Sa		6a	
		blu/red	12	3Sb		6b	
7	red/ora		13	4Ea	Basic rate access 4	7a	
		ora/red	14	4Eb		7b	
8	red/grn		15	4Sa		8a	
		grn/red	16	4Sb		8b	
9	red/brn		17	5Ea	Basic rate access 5	9a	
		brn/red	18	5Eb		9b	
10	red/gry		19	5Sa		10a	
		gry/red	20	5Sb		10b	
11	blk/blu		24	6Ea	Basic rate access 6	11a	
		blu/blk	25	6Eb		11b	
12	blk/ora		26	6Sa		12a	
		ora/blk	27	6Sb		12b	
13	blk/grn		29	7Ea	Basic rate access 7	13a	
		grn/blk	30	7Eb		13b	
14	blk/brn		31	7Sa		14a	
		brn/blk	32	7Sb		14b	
15	blk/gry		34	8Ea	Basic rate access 8	15a	
		gry/blk	35	8Eb		15b	
16	yel/blu		37	8Sa		16a	
		blu/yel	38	8Sb		16b	

Table 3-93 STMD3 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack			STMD3		Notes
No.	Subscriber line Pin	Trunk connection Pin			
1	3	4	1Ea	Basic rate access 1	
	6	5	1Eb		
	4	3	1Sa		
	5	6	1Sb		
2	3	4	2Ea	Basic rate access 2	
	6	5	2Eb		
	4	3	2Sa		
	5	6	2Sb		
3	3	4	3Ea	Basic rate access 3	
	6	5	3Eb		
	4	3	3Sa		
	5	6	3Sb		
4	3	4	4Ea	Basic rate access 4	
	6	5	4Eb		
	4	3	4Sa		
	5	6	4Sb		
5	3	4	5Ea	Basic rate access 5	
	6	5	5Eb		
	4	3	5Sa		
	5	6	5Sb		
6	3	4	6Ea	Basic rate access 6	
	6	5	6Eb		
	4	3	6Sa		
	5	6	6Sb		
7	3	4	7Ea	Basic rate access 7	
	6	5	7Eb		
	4	3	7Sa		
	5	6	7Sb		
8	3	4	8Ea	Basic rate access 8	
	6	5	8Eb		
	4	3	8Sa		
	5	6	8Sb		

Table 3-94 STMD3 - Connector Panel Assignment with CHAMP Jack (For U.S. Only)

CHAMP jack	STMD3		Notes
1	S_0, Receive	Basic rate access 1	
26	S_0, Receive		
2	S_0, Transmit		
27	S_0, Transmit		
3	S_0, Receive	Basic rate access 2	
28	S_0, Receive		
4	S_0, Transmit		
29	S_0, Transmit		
5	S_0, Receive	Basic rate access 3	
30	S_0, Receive		
6	S_0, Transmit		
31	S_0, Transmit		
7	S_0, Receive	Basic rate access 4	
32	S_0, Receive		
8	S_0, Transmit		
33	S_0, Transmit		
9	S_0, Receive	Basic rate access 5	
34	S_0, Receive		
10	S_0, Transmit		
35	S_0, Transmit		
11	S_0, Receive	Basic rate access 6	
36	S_0, Receive		
12	S_0, Transmit		
37	S_0, Transmit		
13	S_0, Receive	Basic rate access 7	
38	S_0, Receive		
14	S_0, Transmit		
39	S_0, Transmit		
15	S_0, Receive	Basic rate access 8	
40	S_0, Receive		
16	S_0, Transmit		
41	S_0, Transmit		

Table 3-95 STMD3 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	STMD3		MDFU-E	S_0 patch panel, MW8 pin	
								Station connection	Trunk connection
1	1	wht/blu		19	1Ea	Basic rate access 1	1a	3	4
			blu/wht	39	1Eb		1b	6	5
	2	wht/ora		38	1Sa		2a	4	3
			ora/wht	48	1Sb		2b	5	6
	3	wht/grn		27	2Ea	Basic rate access 2	3a	3	4
			grn/wht	47	2Eb		3b	6	5
	4	wht/brn		16	2Sa		4a	4	3
			brn/wht	46	2Sb		4b	5	6
	5	wht/gry		05	3Ea	Basic rate access 3	5a	3	4
			gry/wht	45	3Eb		5b	6	5
2	6	red/blu		14	3Sa		6a	4	3
			blu/red	44	3Sb		6b	5	6
	7	red/ora		23	4Ea	Basic rate access 4	7a	3	4
			ora/red	43	4Eb		7b	6	5
	8	red/grn		32	4Sa		8a	4	3
			grn/red	42	4Sb		8b	5	6
	9	red/brn		11	5Ea	Basic rate access 5	9a	3	4
			brn/red	31	5Eb		9b	6	5
	10	red/gry		02	5Sa		10a	4	3
			gry/red	22	5Sb		10b	5	6
3	11	blk/blu		13	6Ea	Basic rate access 6	11a	3	4
			blu/blk	33	6Eb		11b	6	5
	12	blk/ora		04	6Sa		12a	4	3
			ora/blk	24	6Sb		12b	5	6
	13	blk/grn		15	7Ea	Basic rate access 7	13a	3	4
			grn/blk	35	7Eb		13b	6	5
	14	blk/brn		06	7Sa		14a	4	3
			brn/blk	26	7Sb		14b	5	6
	15	blk/gry		17	8Ea	Basic rate access 8	15a	3	4
			gry/blk	37	8Eb		15b	6	5
4	16	yel/blu		08	8Sa		16a	4	3
			blu/yel	28	8Sb		16b	5	6

3.3.22 STMD8

Introduction

The STMD8 (**S**ubscriber And **T**runk **M**odule **D**igital S_0) board contains eight S_0 basic rate accesses for HiPath 3750 and HiPath 3700, which are used

- for the S0 trunk connection (via NT) (not for U.S.)
- for a Point-to-point or point-to-multipoint connection
- for S0 networking (not for U.S) (CorNet N, CorNet NQ or QSig)
- for an S0 bus for connecting ISDN telephones (not for U.S.) (separate power supply required).

Switches and LEDs

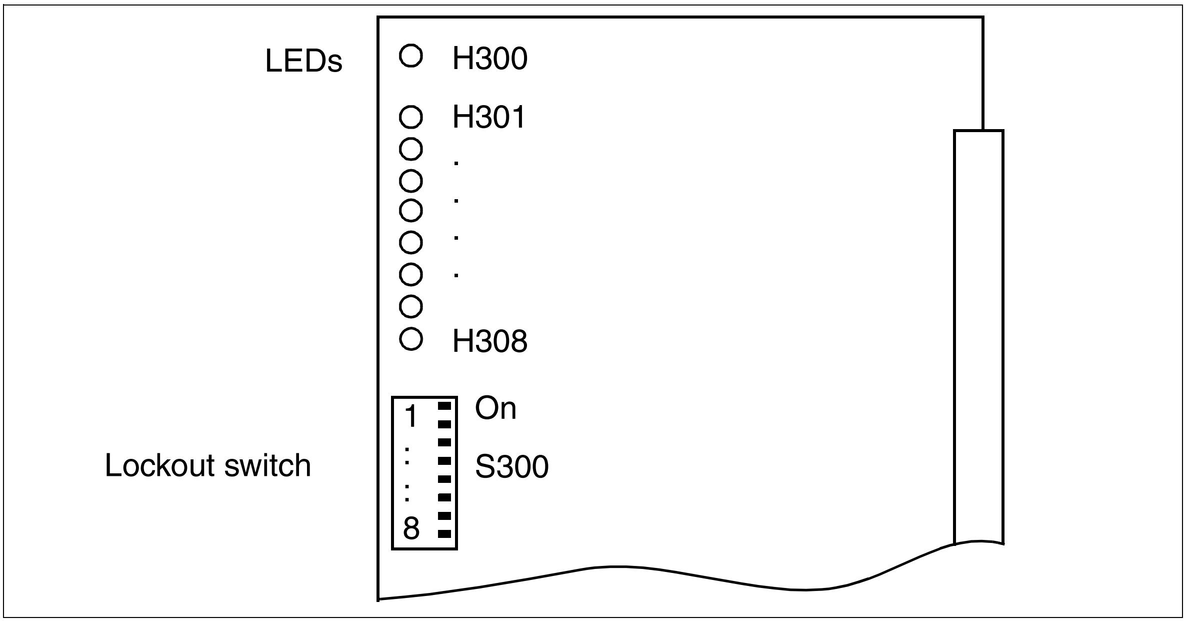


Figure 3-85 STMD8 (S30810-Q2558-X200)

LED statuses and their meanings

- H300 LED (see Figure 3-85): Reference clock display (clock is generated if this feature was configured using HiPath 3000 Manager E).
  - On: Reference clock for clock generator is created.
  - Off: No reference clock
- LEDs H301 to H308 (see Figure 3-85)

Table 3-96 STMD8 - LED Statuses (H301 to H308)

LED Status (on/off)	Meaning	Action
During Startup and Initialization		
Flickering (50/50 ms)	Board test unsuccessful	Replace board.
Flashing (100/100 ms)	Board not configured	Inspect visually, remove and re-insert board if necessary. Replace board if flashing continues.
On	Loading in progress	
Flashing (100/100 ms)	Code could not be loaded	Replace board.
Off	Board loaded	
Flashing (500/500 ms)	Board loaded but not yet activated	
During Operation		
On	ISDN layer 2 activated	
Flickering (450/50 ms)	Dependability test (loopback test) in progress	
Flashing (500/500 ms)	Board is out of service (e.g. S300/x “closed”)	Check whether board was deactivated using HiPath 3000 Manager E or lockout switch.
Off	ISDN layer 2 not activated	

S_0 trunk connection (via NT) (not for U.S.)

Table 2-10 lists examples of the maximum cable lengths for connecting trunks.

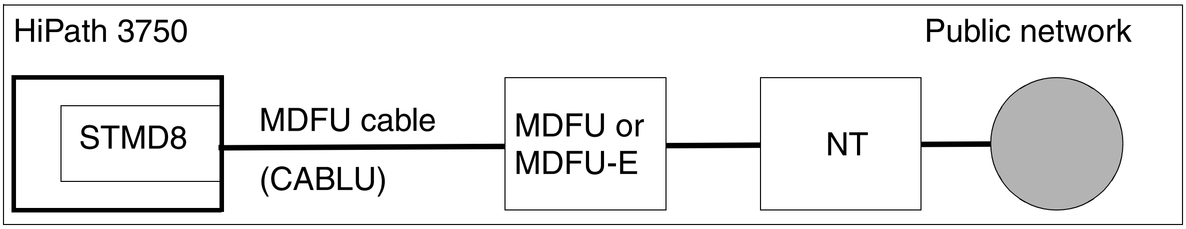

HiPath 3750
Public network
STMD8
MDFU cable
(CABLU)
MDFU or
MDFU-E
NT

Figure 3-86 S_0 Trunk Connection (Example for HiPath 3750)

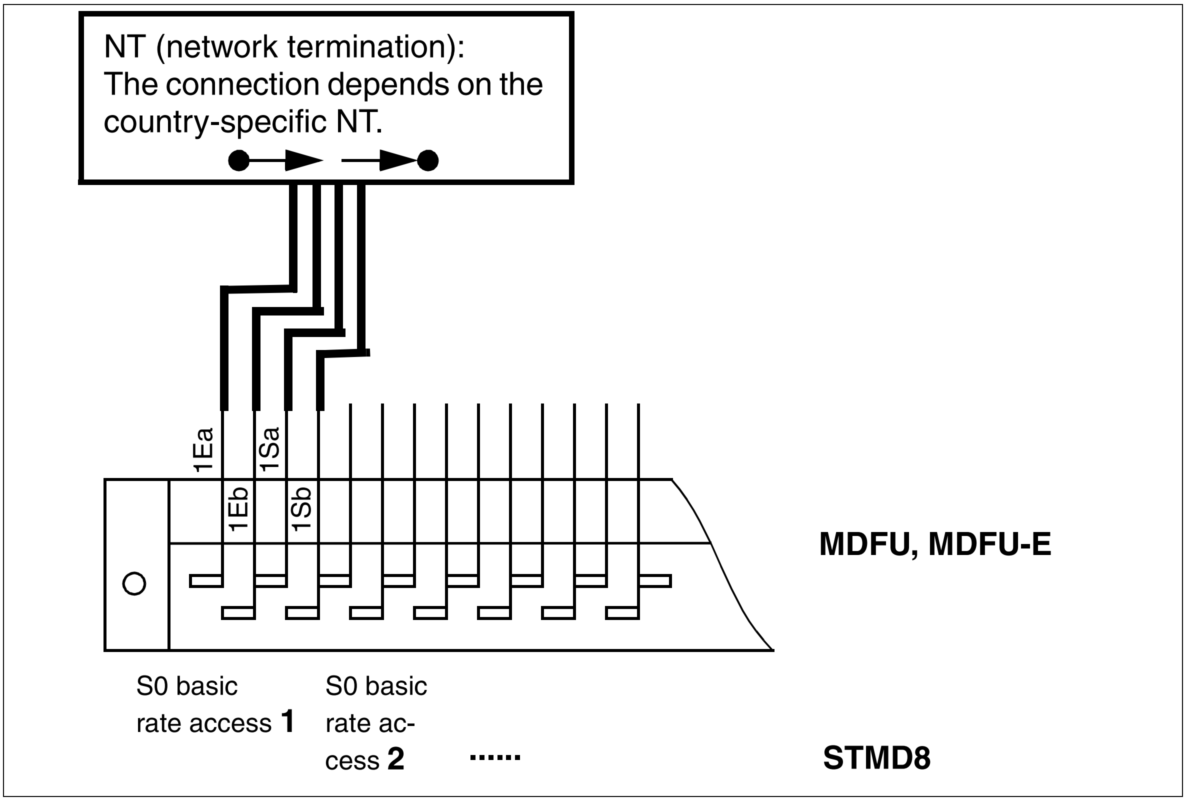

NT (network termination):
The connection depends on the country-specific NT.
1Ea
1Eb
1Sa
1Sb
MDFU, MDFU-E
S0 basic rate access 1
S0 basic rate access 2
......
STMD8

Figure 3-87 S_0 NT Connection(Not for U.S.)

When starting up S_0 ports during operation with PABXs, it is important to ensure that the NT switch is in the POINT-TO-POINT position.

Point-to-point or point-to-multipoint connection

- Point-to-multipoint connection
  HiPath 3750/HiPath 3700 can be operated on an ISDN multi-device connection (S_0 bus) to CO. This allows parallel operation to other ISDN devices located on this port.

  Note the following:

  – Maintain the correct polarity on the T/R wires.

  – The phone company assigns an 11-digit DID number (MSN or **m**ultiple **s**ubscriber **n**umber) for telephones to be connected to the S_0 bus. There are usually at least three MSNs per basic rate access.

  – When setting the system-wide ISDN parameters, select "EURO CO PMP" under Port configuration (code 20 4 1) for the port you are using.

  – Enter the MSN in the table for DID numbers. For each MSN assigned, callers can directly dial a station, group, or hunt group in the HiPath 3750 and HiPath 3700 system.

  – Leave the "PABX number" parameter unchanged.

  – Always configure HiPath 3750 and HiPath 3700 as the last station on the S_0 bus because terminating resistors (2 x 100 Ω) are permanently installed in the trunk connection of the communications server. Remove any terminating resistors from the last socket.

- Point-to-point connection
  Use a point-to-point connection if you have a dedicated line (trunk circuit/tie trunk circuit) or to extend the range if only one telephone is connected to the S_0 bus.

S0 networking (not for U.S)

For examples of the maximum cable lengths for direct CorNet N/CorNet NQ networking, please refer to Table 2-10.

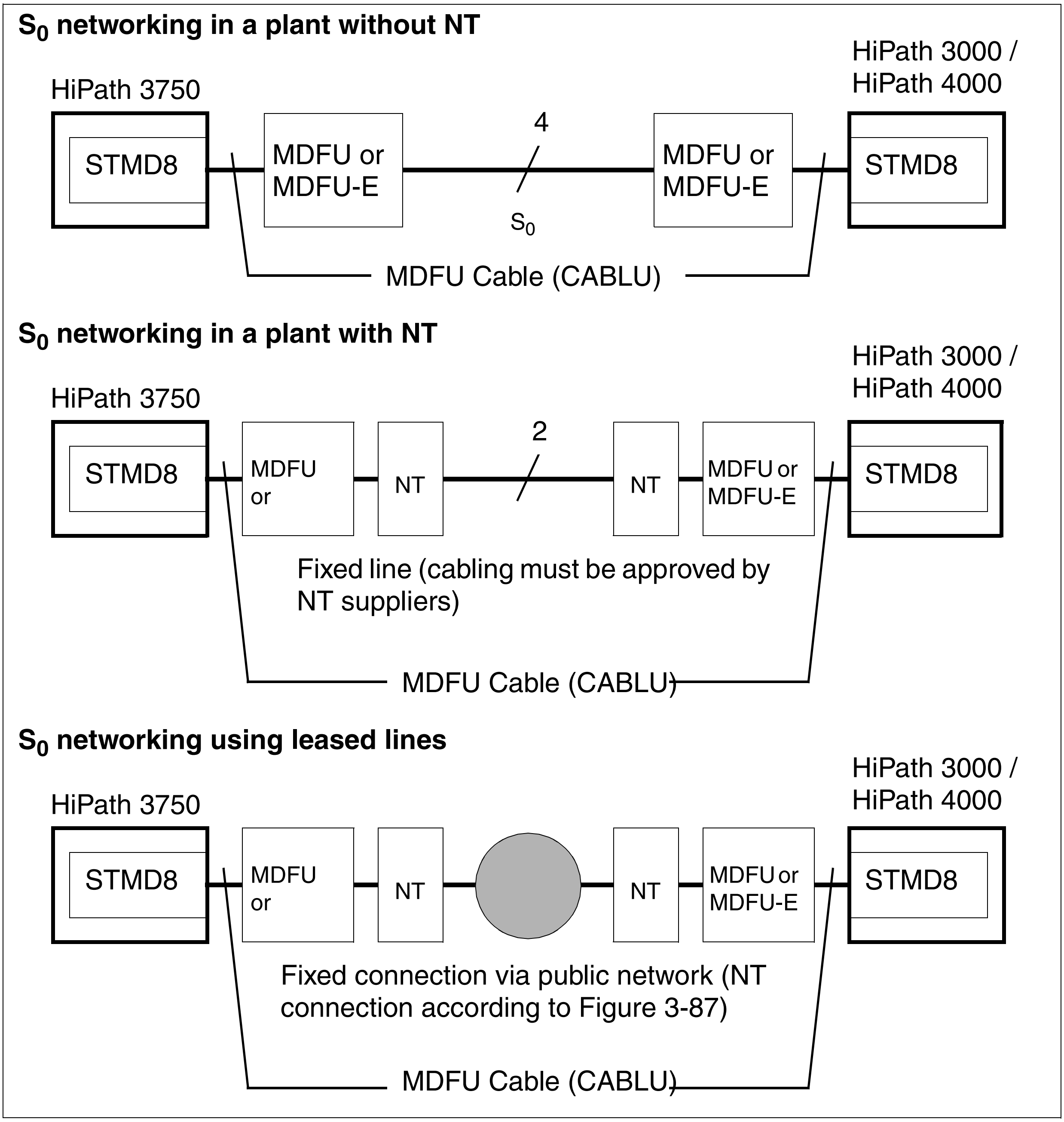
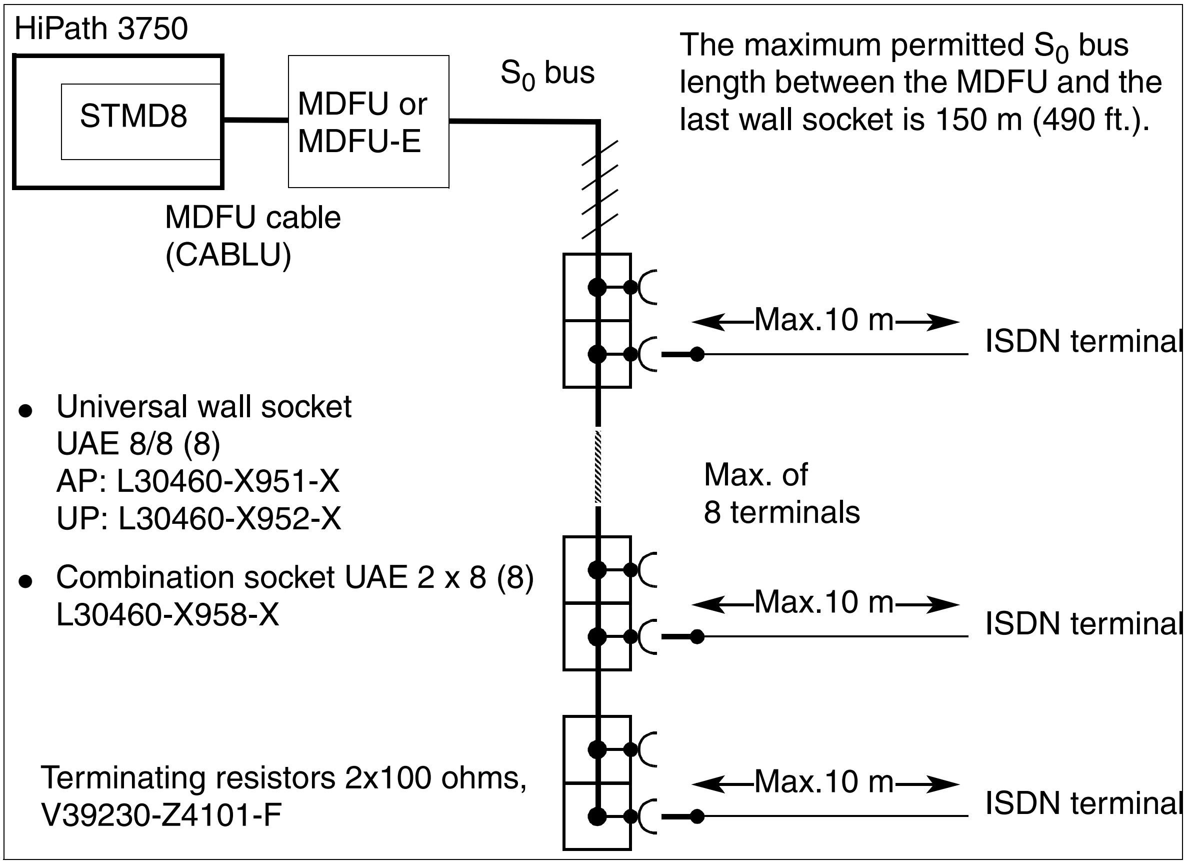

S_0 networking in a plant without NT
HiPath 3750
STMD8
MDFU or MDFU-E
4
S_0
MDFU or MDFU-E
HiPath 3000 / HiPath 4000
STMD8
MDFU Cable (CABLU)
S_0 networking in a plant with NT
HiPath 3750
STMD8
MDFU or
NT
2
NT
MDFU or MDFU-E
HiPath 3000 / HiPath 4000
STMD8
Fixed line (cabling must be approved by NT suppliers)
MDFU Cable (CABLU)
S_0 networking using leased lines
HiPath 3750
STMD8
MDFU or
NT
NT
MDFU or MDFU-E
HiPath 3000 / HiPath 4000
STMD8
Fixed connection via public network (NT connection according to Figure 3-87)
MDFU Cable (CABLU)

Figure 3-88 S_0 Networking Options (Not for U.S.) (Examples for HiPath 3750)

S_0 bus for connecting ISDN telephones (not for U.S.)

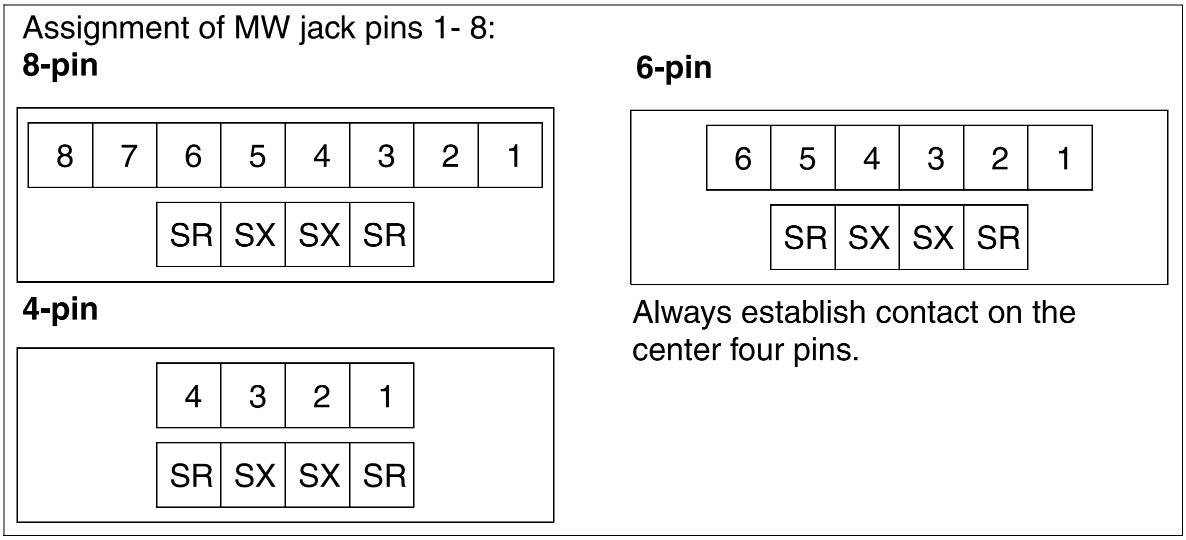

HiPath 3750
STMD8
MDFU or
MDFU-E
S_0 bus
MDFU cable
(CABLU)
Max.10 m
ISDN terminal
Max. of
8 terminals
Max.10 m
ISDN terminal
Max.10 m
ISDN terminal

The maximum permitted S_0 bus length between the MDFU and the last wall socket is 150 m (490 ft.).

- Universal wall socket
  UAE 8/8 (8)
  AP: L30460-X951-X
  UP: L30460-X952-X
- Combination socket UAE 2 x 8 (8)
  L30460-X958-X

Terminating resistors 2x100 ohms,
V39230-Z4101-F

Figure 3-89 S_0 Bus to the STMD8 over the MDFU or MDFU-E (Not for U.S.)



Assignment of MW jack pins 1- 8:

8-pin

8	7	6	5	4	3	2	1
		SR	SX	SX	SR		

6-pin

6	5	4	3	2	1
	SR	SX	SX	SR	

4-pin

4	3	2	1
SR	SX	SX	SR

Always establish contact on the center four pins.

Figure 3-90 Pin Assignments in MW Jacks

S_0 bus - example of jack assignment (not for U.S.)

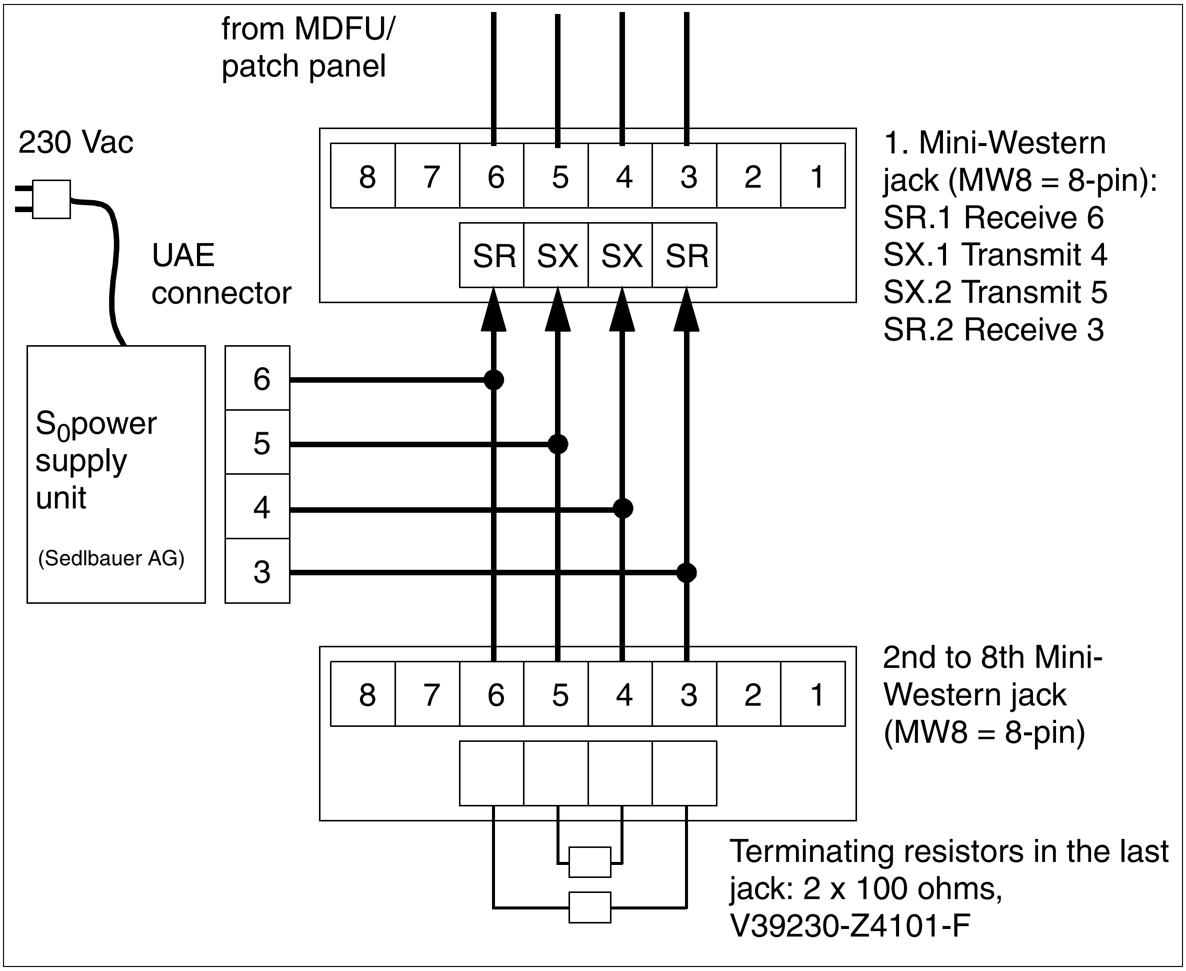

from MDFU/
patch panel
230 Vac
UAE
connector
8 7 6 5 4 3 2 1
SR SX SX SR
1. Mini-Western
jack (MW8 = 8-pin):
SR.1 Receive 6
SX.1 Transmit 4
SX.2 Transmit 5
SR.2 Receive 3
S_0power
supply
unit
(Sedlbauer AG)
6
5
4
3
8 7 6 5 4 3 2 1
2nd to 8th Mini-
Western jack
(MW8 = 8-pin)
Terminating resistors in the last
jack: 2 x 100 ohms,
V39230-Z4101-F

Figure 3-91 S_0 Bus - Example of Jack Assignment (Not for U.S.)

ISDN boards can also be connected to available optiPoint 500 series telephones (except for optiPoint 500 entry and optiPoint 500 economy) using an optiPoint ISDN Adapter.

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-97 STMD8 - Cable and Connector Assignment (Not for U.S.)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	STMD8		MDFU/ MDFU-E	S_0 patch panel, MW8 pin	
				BP: Xx8				Station connection	Trunk connection
1	1	wht/blu		19	1Ea	Basic rate access 1	1a	3	4
			blu/wht	39	1Eb		1b	6	5
	2	wht/ora		38	1Sa		2a	4	3
			ora/wht	48	1Sb		2b	5	6
	3	wht/grn		27	2Ea	Basic rate access 2	3a	3	4
			grn/wht	47	2Eb		3b	6	5
	4	wht/brn		16	2Sa		4a	4	3
			brn/wht	46	2Sb		4b	5	6
	5	wht/gry		05	3Ea	Basic rate access 3	5a	3	4
			gry/wht	45	3Eb		5b	6	5
2	6	red/blu		14	3Sa		6a	4	3
			blu/red	44	3Sb		6b	5	6
	7	red/ora		23	4Ea	Basic rate access 4	7a	3	4
			ora/red	43	4Eb		7b	6	5
	8	red/grn		32	4Sa		8a	4	3
			grn/red	42	4Sb		8b	5	6
	9	red/brn		11	5Ea	Basic rate access 5	9a	3	4
			brn/red	31	5Eb		9b	6	5
	10	red/gry		02	5Sa		10a	4	3
			gry/red	22	5Sb		10b	5	6
3	11	blk/blu		13	6Ea	Basic rate access 6	11a	3	4
			blu/blk	33	6Eb		11b	6	5
	12	blk/ora		04	6Sa		12a	4	3
			ora/blk	24	6Sb		12b	5	6
	13	blk/grn		15	7Ea	Basic rate access 7	13a	3	4
			grn/blk	35	7Eb		13b	6	5
	14	blk/brn		06	7Sa		14a	4	3
			brn/blk	26	7Sb		14b	5	6
	15	blk/gry		17	8Ea	Basic rate access 8	15a	3	4
			gry/blk	37	8Eb		15b	6	5
4	16	yel/blu		08	8Sa		16a	4	3
			blu/yel	28	8Sb		16b	5	6

Table 3-98 STMD8 - Assignment (SUXx8) (For U.S. Only)

#	a-Wire (Tip)	b-Wire (Ring)	SU connector	STMD8		CHAMP jack, MDF		Notes
			Backplane: Xx8					
1	wht/blu		19	1Ra	Port 1	1	1 Receive –	
		blu/wht	39	1Rb		26	1 Receive +	
2	wht/ora		38	1Sa		2	1 Transmit –	
		ora/wht	48	1Sb		27	1 Transmit +	
3	wht/grn		27	2Ra	Port 2	3	2 Receive –	
		grn/wht	47	2Rb		28	2 Receive +	
4	wht/brn		16	2Sa		4	2 Transmit –	
		brn/wht	46	2Sb		29	2 Transmit +	
5	wht/gry		05	3Ra	Port 3	5	3 Receive –	
		gry/wht	45	3Rb		30	3 Receive +	
6	red/blu		14	3Sa		6	3 Transmit –	
		blu/red	44	3Sb		31	3 Transmit +	
7	red/ora		23	4Ra	Port 4	7	4 Receive –	
		ora/red	43	4Rb		32	4 Receive +	
8	red/grn		32	4Sa		8	4 Transmit –	
		grn/red	42	4Sb		33	4 Transmit +	
9	red/brn		11	5Ra	Port 5	9	5 Receive –	
		brn/red	31	5Rb		34	5 Receive +	
10	red/gry		02	5Sa		10	5 Transmit –	
		gry/red	22	5Sb		35	5 Transmit +	
11	blk/blu		13	6Ra	Port 6	11	6 Receive –	
		blu/blk	33	6Rb		36	6 Receive +	
12	blk/ora		04	6Sa		12	6 Transmit –	
		ora/blk	24	6Sb		37	6 Transmit +	
13	blk/grn		15	7Ra	Port 7	13	7 Receive –	
		grn/blk	35	7Rb		38	7 Receive +	
14	blk/brn		06	7Sa		14	7 Transmit –	
		brn/blk	26	7Sb		39	7 Transmit +	
15	blk/gry		17	8Ra	Port 8	15	8 Receive –	
		gry/blk	37	8Rb		40	8 Receive +	
16	yel/blu		08	8Sa		16	8 Transmit –	
		blu/yel	28	8Sb		41	8 Transmit +	
No other wires used.								

Connecting ISDN terminals to HiPath 3750, HiPath 3700 (for U.S. only)

S_0 bus with MW jack

You must change the signal sequence to connect up ISDN telephones. Transmit wires must be on the inside; receive wires on the outside (see Figure 3-92).

To do so, jumper the four wires on the provided line cord to the pins for the STMD8 ports on the main distribution frame (MDF).

The ISDN terminals must have their own local power supply.

S_0 bus wiring from STMD8 port on MDF or from optiset E ISDN adapter (for U.S. only)

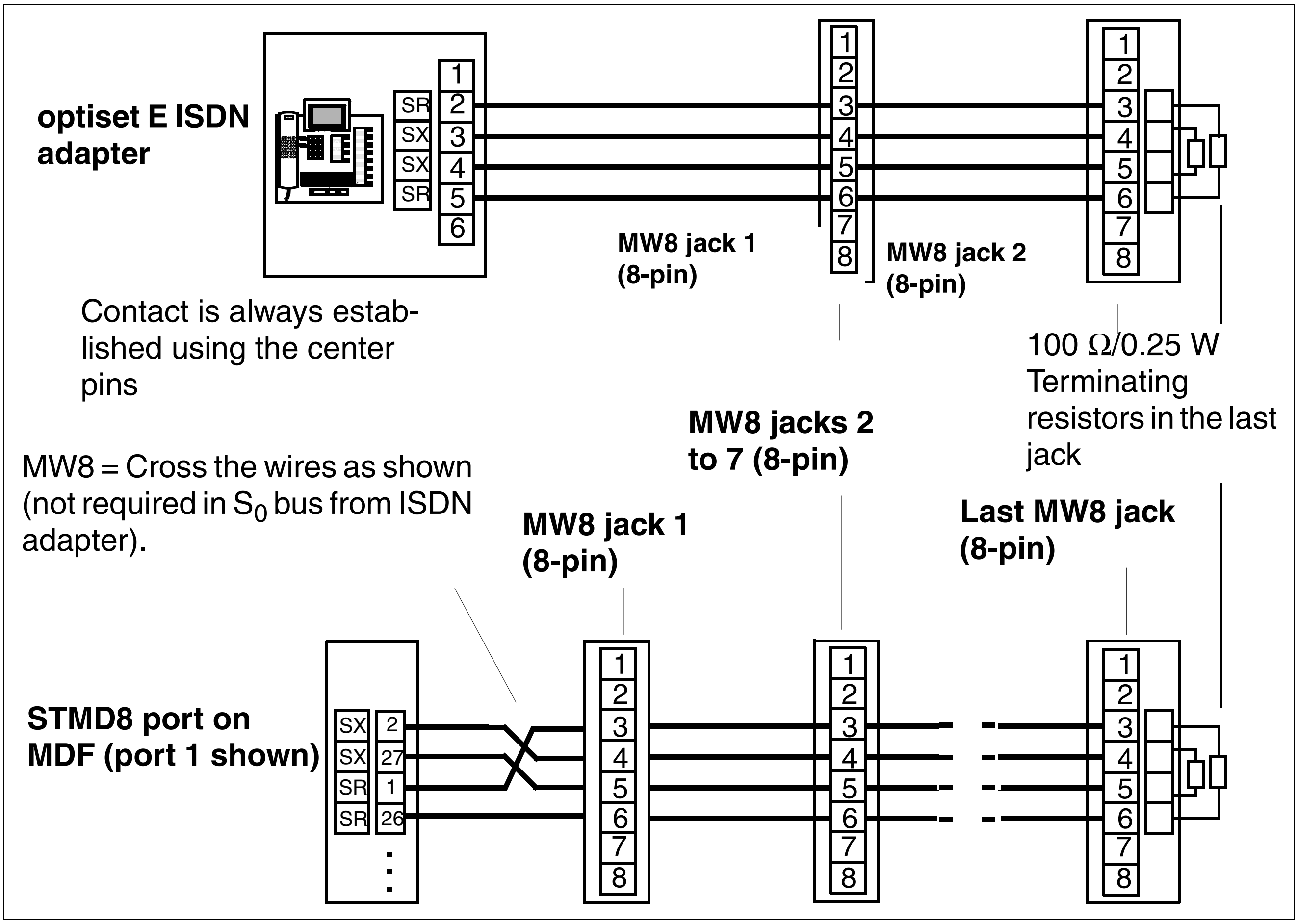

optiset E ISDN adapter
SR
SX
SX
SR
1
2
3
4
5
6
MW8 jack 1 (8-pin)
MW8 jack 2 (8-pin)
1
2
3
4
5
6
7
8
Contact is always established using the center pins
100 Ω/0.25 W Terminating resistors in the last jack
MW8 jacks 2 to 7 (8-pin)
MW8 = Cross the wires as shown (not required in S_0 bus from ISDN adapter).
MW8 jack 1 (8-pin)
Last MW8 jack (8-pin)
STMD8 port on MDF (port 1 shown)
SX
SX
SR
SR
2
27
1
26

Figure 3-92 STMD8 - S_0 Bus Wiring from STMD8 Port or from ISDN Adapter (for U.S. only)

3.3.23 STMI2

Introduction

STMI2 (**S**ubscriber **T**runk **M**odule **I**P) is a VoIP gateway board (VoIP - Voice over IP) which provides the functionality of HG 1500 in HiPath 3800. This includes:

- Connection of a local LAN to the HiPath 3800 and connection with external LANs via the ISDN and DSL interfaces of HiPath 3800.
- Support for the conventional functions of an ISDN and DSL router with the additional functionality of a media gateway for the transfer of voice, fax and data.
- Forwarding of calls between IP-supported networks (LAN, intranet, Internet) and circuit-switched networks (ISDN, PSTN).

Configuration is performed via Web-based management (WBM) which enables the administration of HG 1500 without any special software requirements.

> A combination of up to eight STMI2 boards can be used per system, but the following restrictions must be observed:
> - A maximum of four STMI2 boards may be inserted per HiPath 3800 cabinet.
> - To allow for future channel expansion with extension modules, the slot between two STMI2 boards should remain free.
>
> For information on configuration, refer to the HG 1500 Administration Manual.

For information on how to calculate the number of boards required for HG 1500, see Section 10.6.4.

Board versions

Table 3-99 STMI2 - Board Variants

Board	Part number	Services	DSPs	B channels DSP channels
STMI2	S30810-Q2316-X100	Voice and Data	2	32

Sixteen simultaneous Voice over IP connections are possible per DSP (Digital Signal Processor).

Extension modules

The STMI2 board has two HGA (HiPath Gateway Accelerator) slots, which can be used to connect the extension modules.

Table 3-100 STMI2 - Extension Modules

Extension module	Part number	Function	Notes
PDMX (**P**MC **D**SP **M**odule E**x**tended)	S30807-Q5697-X200		The PDMX extension module is not released at present.

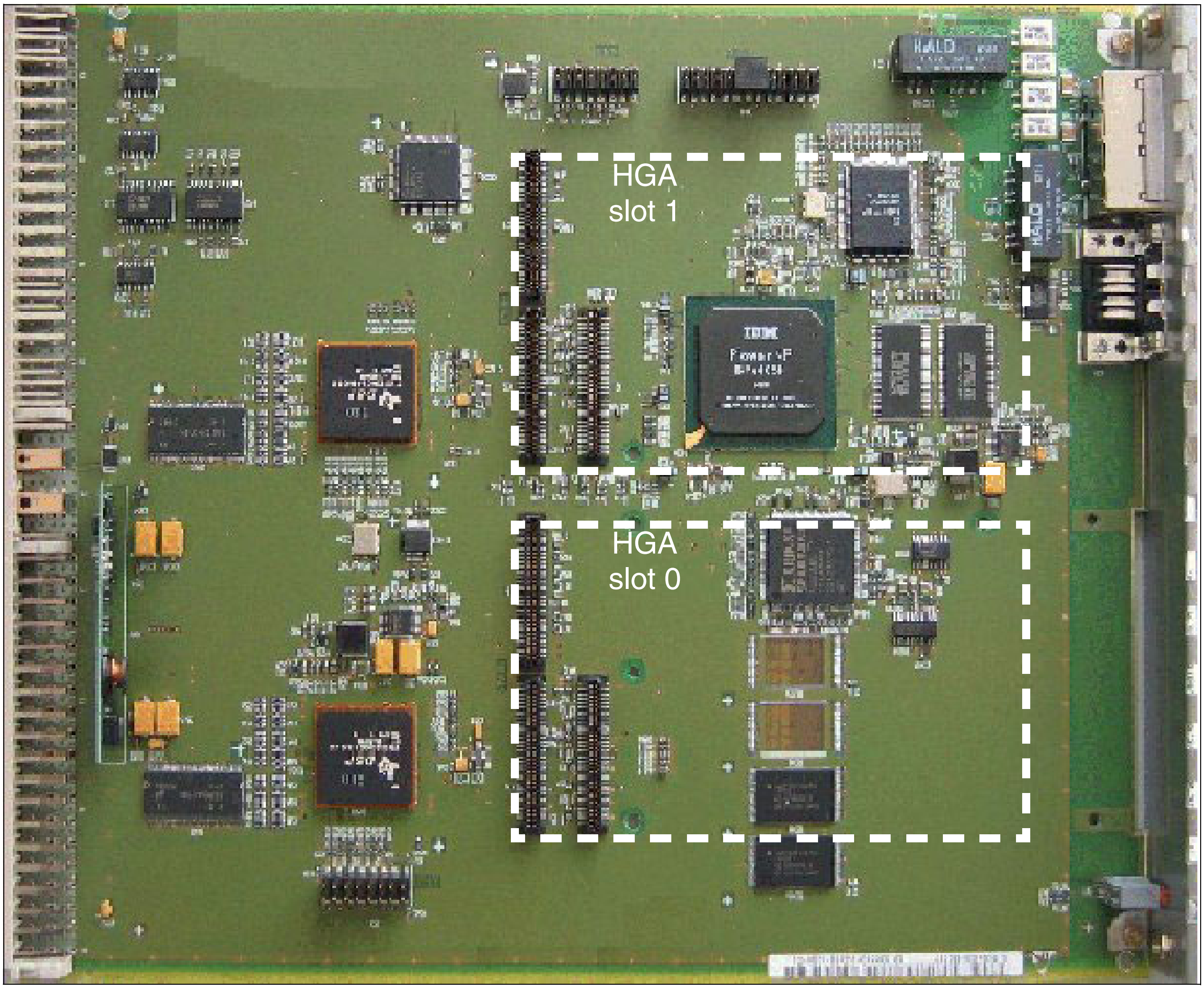


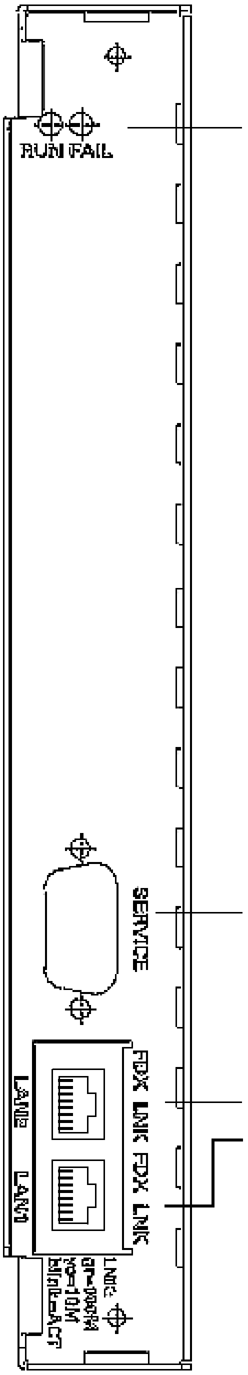
Figure 3-93 STMI2 (S30810-Q2316-X100) - HGA Slots

Connections

The STMI2 board features the following connections on the front panel:

- Two RJ45 jacks for LAN interfaces. These provide access to the Ethernet standard (IEEE 802.3) with 10 Mbps or 100 Mbps with automatic configuration. Manual configuration is also possible.
- 9-pin Sub-D plug for V.24 interface

Front panel


RUN FAIL
SERVICE
LAN2
LAN1
FDX LNK FDX LNK
LNK:
GN=100M
YE=10M
blink=ACT

Two LEDs indicating the board status:
- Run (green)
  - on = at least 1 B channel busy
  - off = normal operation
- Fail (red) = error encountered

V.24 interface (9-pin Sub-D plug)

Two Ethernet (10/100BaseT) LAN connectors (8-pin RJ45 jacks):
- LAN2 (only released for service applications)
- LAN1

The LAN interface status is indicated by two LEDs:
- LED1:
  - Green = 100 Mbps online (link)
  - Yellow = 10 Mbps online (link)
  - Flashing = active
- LED2 (green):
  - On = full-duplex (FDX)
  - Off = half-duplex

Figure 3-94 STMI2 - Front Panel

V.24interface

The V.24 cable (C30267-Z355-A25) is used for connecting the service PC.

The following settings must be chosen for a terminal or PC connected to the V.24 interface:

Transmission rate	38,400 (default)
Data bits	8
Parity bit	None
Stop bits	1
Data flow control	None

It is recommended that the local echo be deactivated on the connected terminal or PC.

Table 3-101 STMI2 - V.24 Interface Assignment

Pin	Signal	I/O	Remark
1	DCD		Not used
2	RxD	I	Internal pull-up resistor in level switch (MAX211E)
3	TxD	O	
4	DTR	O	
5	0 V		Ground
6	DSR	I	Internal pull-up resistor in level switch (MAX211E)
7	RTS	O	
8	CTS	I	Internal pull-up resistor in level switch (MAX211E)
9	RI		Not used

LAN interfaces

Table 3-102 STMI2 - LAN Interface Assignment (RJ45 Jacks)

Pin	Signal
1	TDP (Transmit Data +)
2	TDN (Transmit Data –)
3	RDP (Receive Data +)
4	TT1 (Transmit Termination 1)
5	TT2 (Transmit Termination 2)
6	RDN (Receive Data –)
7	RT1 (Receive Termination 1)
8	RT2 (Receive Termination 2)
Signals TT1/2 and RT1/2 are not needed for transmitting data. They represent a signal termination of 100 ohms (so-called Bob Smith termination) for the two unused wire pairs in a 4-pair twisted pair cable.	

3.3.24 TIEL

Introduction

The TIEL board (Tie Line Ear & Mouth) provides four bothway analog tie trunk circuits for E&M signaling for HiPath 3750 and HiPath 3700. Each tie trunk circuit has eight connectors: incoming speech path (2), outgoing speech path (2), incoming signaling (2) and outgoing signaling (2).
This allows tie trunk traffic to other private communication systems.

Speech paths

The speech paths can be set to four-wire or two-wire mode. Four-wire connections should be used for high transmission quality on analog networks (this description deals only with four-wire mode).

The advantage of separate speech paths for the incoming and outgoing directions is that the stability (echo) of a connection is not adversely affected. In addition, repeaters in the transmission equipment compensate for attenuation loss on the line.

E&M signaling paths

The E&M signaling paths carry the signals that control connection setup and cleardown. Various interfaces can be selected, depending on the requirements of the remote system or transmission equipment. These interface types have different numbers of wires and different potentials.

Starting up a tie trunk

Before you can start up a tie trunk, you must determine the type of interface supported by the two systems. Type 2 is preferable because it virtually excludes problems with longitudinal voltages.

Characteristics of the interface types

- E&M interface type 1 (Figure 3-96)
  The interface in the transmission equipment does not require negative power feeding. This type uses only two signal wires; the communication system and transmission equipment are non-floating, so they are not protected from longitudinal voltage.
- E&M interface type 1A (Figure 3-97)
  Same as type 1, but without a 0-V rest potential on the M-wire.
- E&M interface type 1B or 5 (Figure 3-98)
  The interfaces in both the transmission equipment and the communication system require negative power feeding. This type uses only two signal wires. The two M-wires are connected to 0-V potential only, meaning that no special measures are required to prevent short-circuit currents in the event of ground leakage. The communication system and transmission equipment are non-floating, so they are not protected from longitudinal voltage.
- E&M interface type 2 (Figure 3-99
  The interfaces in both the transmission equipment and the communication system require negative power feeding. This type uses four signal wires. The M-contacts are floating, so there is no non-floating link between the communication system and transmission equipment.

  Interface type 2 is recommended; it provides the best longitudinal voltage protection.

- E&M interface type 3
  This type uses four signal wires. The M-signal has GND or $V_{battery}$ (- 48 V) for direct TIEL-to-TIEL connection (without converter).

Interface specifications

Transmit path	
Four-wire transmit level	-3.5 dBr
Four-wire receive level	-3.5 dBr
Characteristic impedance	600 ohms
Frequency range	0.3 to 3.4 kHz, +/- 1 dB
Dielectric strength of speech wires against ground	1 kV surge, 1.2/50 µs and 10/700 µs
Signaling	
Type of E&M interface (programmable)	1, 1A, 1B, 2, 3, 5
Protocols	
To ANSI/EIA/TIA-464-A, configurable	Immediate start Wink signal Delay signal
Signaling method	DP or DTMF

Characteristics of the signaling protocols

Connecting two switching units via a tie trunk requires a protocol supported by both systems. HiPath 3750 and HiPath 3700 supports:

- "Immediate start" protocol
  No seizure acknowledgment; with answer signal.
  This is the most widely used protocol internationally.
- "Wink signal" protocol
  Proceed to send signal using "wink" signal; with answer signal.
  This protocol is the same as the "immediate start" protocol except that it also features a proceed-to-send signal. It is most useful for connecting systems that are not immediately ready for digit input.
- "Delay signal" protocol
  Dial delay with "delay" signal; with answer signal.
  This protocol permits the transmission of dialing information to be delayed until the receiving exchange is ready. It differs from the wink signal protocol only in that the remote system returns a backward signal immediately after seizure even if it is not ready for digit input.

Switches and LEDs

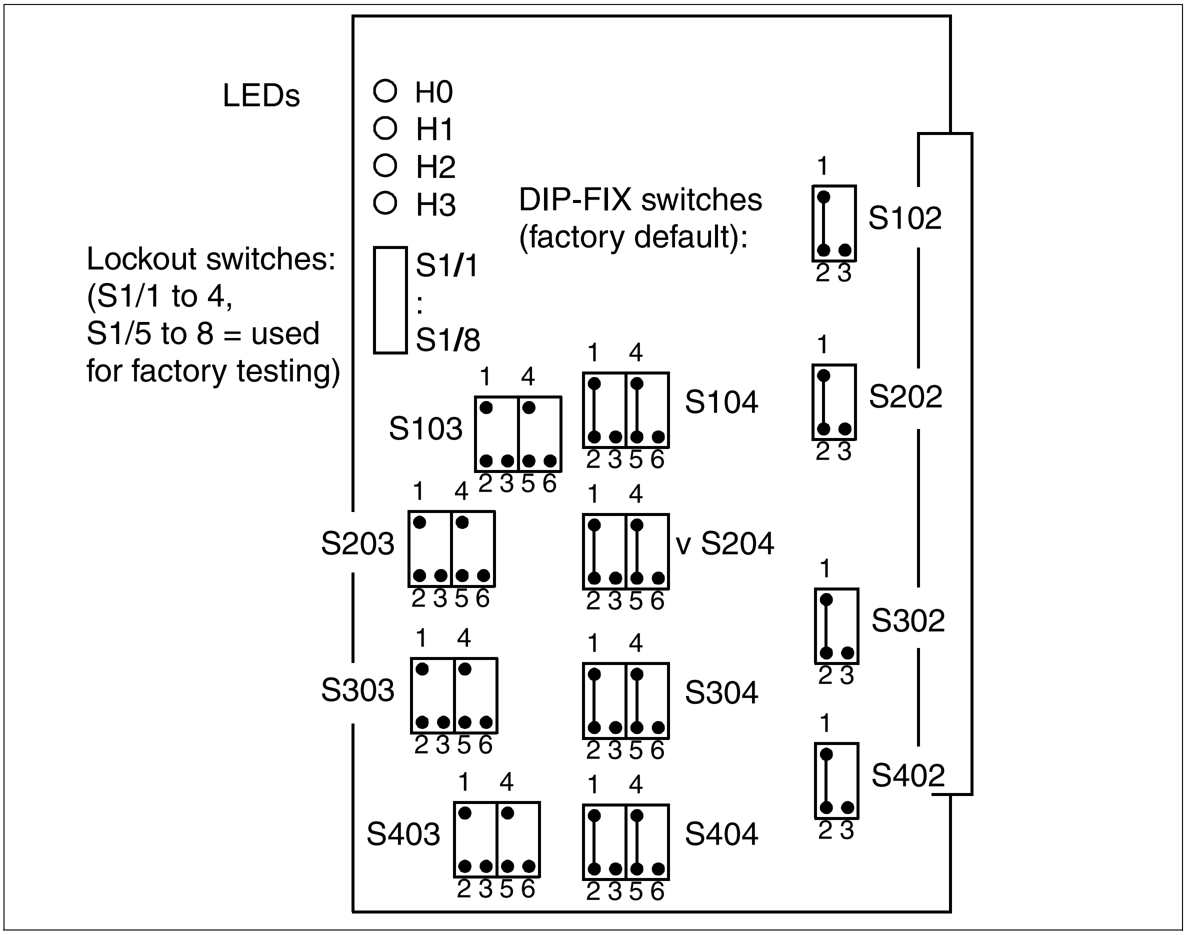

LEDs
H0
H1
H2
H3
DIP-FIX switches
(factory default):
Lockout switches:
(S1/1 to 4,
S1/5 to 8 = used
for factory testing)
S1/1
:
S1/8
S102
S202
S302
S402
S103
S104
S203
v S204
S303
S304
S403
S404
1
4
2 3 5 6
2 3

Figure 3-95 TIEL (S30810-Q2520-X)

DIP-FIX switch positions

Table 3-103 TIEL - Functions of the DIP-FIX Switches

Function	CCT 1		CCT 2		CCT 3		CCT 4	
	Switches	**Position**	**Switches**	**Position**	**Switches**	**Position**	**Switches**	**Position**
Type 1 (Figure 3-96)	S103 S102	1 - 2 4 - 6 1 - 2	S203 S202	1 - 2 4 - 6 1 - 2	S303 S302	1 - 2 4 - 6 1 - 2	S403 S402	1 - 2 4 - 6 1 - 2
Type 1A (Figure 3-97)	S103 S102	1 - 3 4 - 6 1 - 2	S203 S202	1 - 3 4 - 6 1 - 2	S303 S302	1 - 3 4 - 6 1 - 2	S403 S402	1 - 3 4 - 6 1 - 2
Type 1B or 5 (Figure 3-98)	S103 S102	1 - 3 4 - 5 1 - 2	S203 S202	1 - 3 4 - 5 1 - 2	S303 S302	1 - 3 4 - 5 1 - 2	S403 S402	1 - 3 4 - 5 1 - 2
Type 2 (Figure 3-99 and Figure 3-100) (factory default)	S103 S102	Open 1 - 2	S203 S202	Open 1 - 2	S303 S302	Open 1 - 2	S403 S402	Open 1 - 2
Type 3	S103 S102	1 - 2 4 - 6 1 - 3	S203 S202	1 - 2 4 - 6 1 - 3	S303 S302	1 - 2 4 - 6 1 - 3	S403 S402	1 - 2 4 - 6 1 - 3
2 speech wires	S104	1 - 3 4 - 6	S204	1 - 3 4 - 6	S304	1 - 3 4 - 6	S404	1 - 3 4 - 6
4 speech wires (factory default)	S104	1 - 2 4 - 5	S204	1 - 2 4 - 5	S304	1 - 2 4 - 5	S404	1 - 2 4 - 5

Signal wire connection

The following maximum ranges (without converter) must be taken into account:

- 4-wire speech: 8 km for 0.6 mm ∅
- 2-wire speech: 6 km for 0.6 mm ∅

E&M interface type 1 (not for U.S)

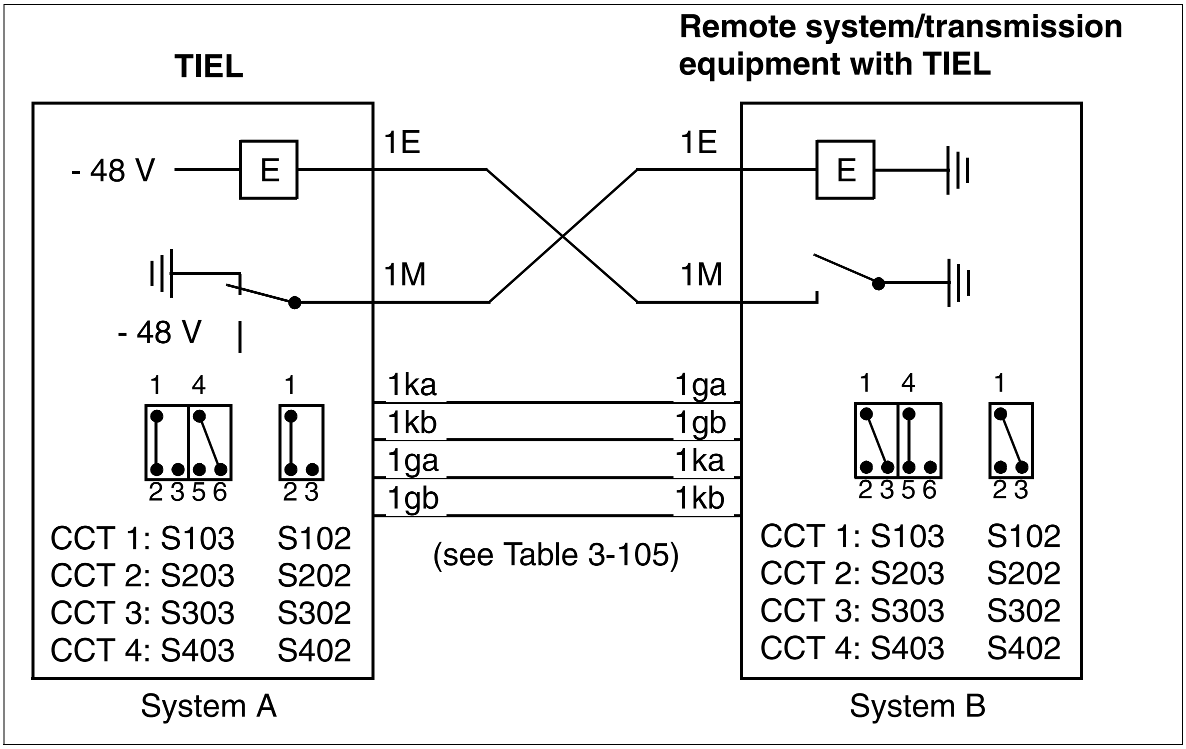

TIEL
Remote system/transmission equipment with TIEL
- 48 V
E
1E
1E
E
1M
1M
- 48 V
1 4
1
2 3 5 6
2 3
1ka
1ga
1kb
1gb
1ga
1ka
1gb
1kb
(see Table 3-105)
1 4
1
2 3 5 6
2 3
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402
System A
System B

Figure 3-96 E&M Interface Type 1 (Not for U.S.)

E&M interface type 1A (not for U.S.)

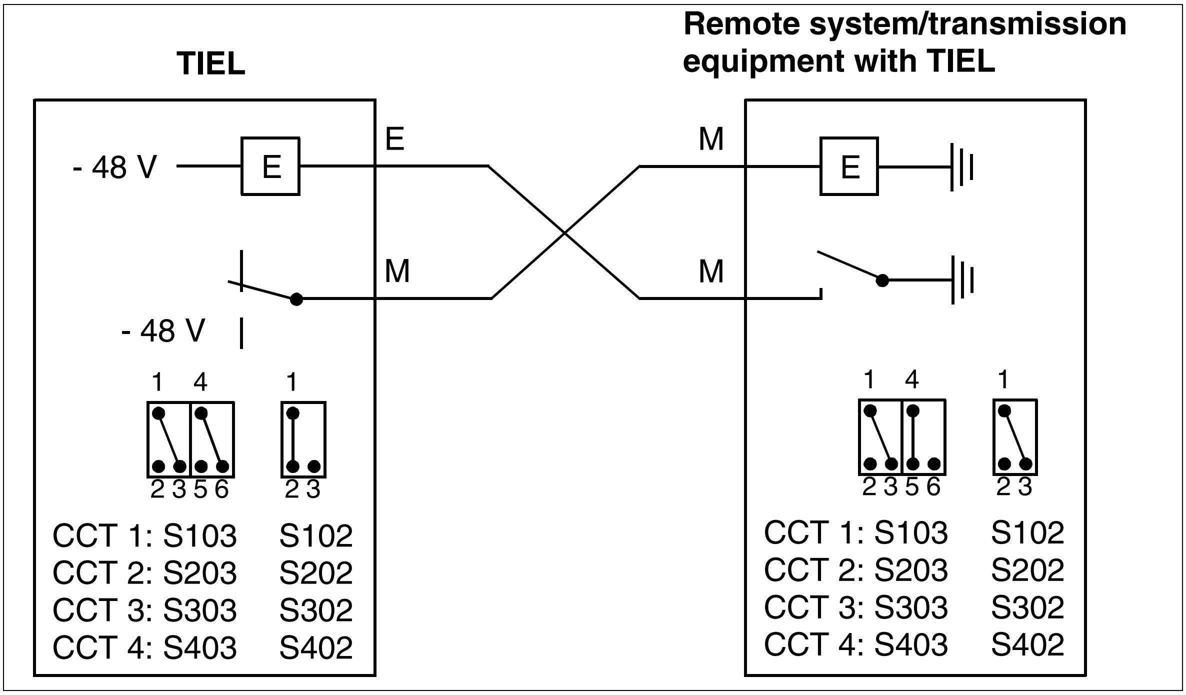

TIEL
Remote system/transmission equipment with TIEL
- 48 V
E
E
M
M
M
- 48 V
E
1 4 1
2 3 5 6 2 3
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402
1 4 1
2 3 5 6 2 3
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402

Figure 3-97 E&M Interface Type 1A (Not for U.S.)

E&M interface type 1B or 5 (not for U.S.)

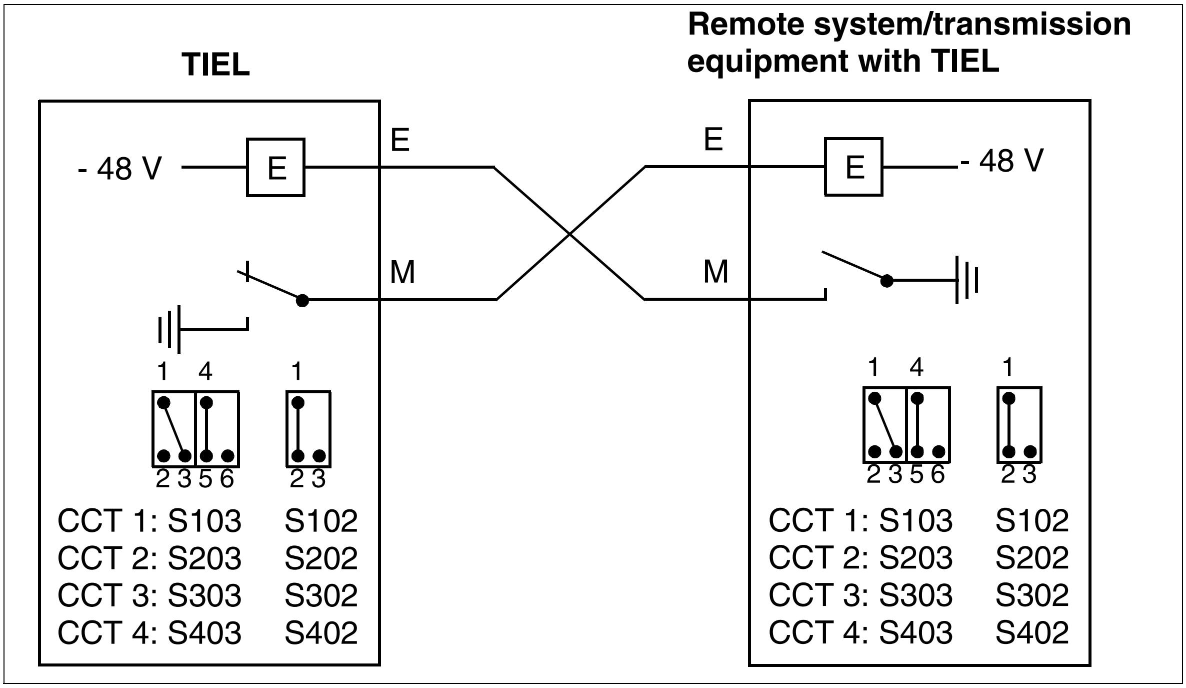

TIEL
Remote system/transmission equipment with TIEL
- 48 V
E
E
M
E
E
M
- 48 V
1 4 1
2 3 5 6 2 3
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402
1 4 1
2 3 5 6 2 3
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402

Figure 3-98 E&M Interface Type 1B or 5 (Not for U.S.)

E&M interface type 2 (not for U.S)

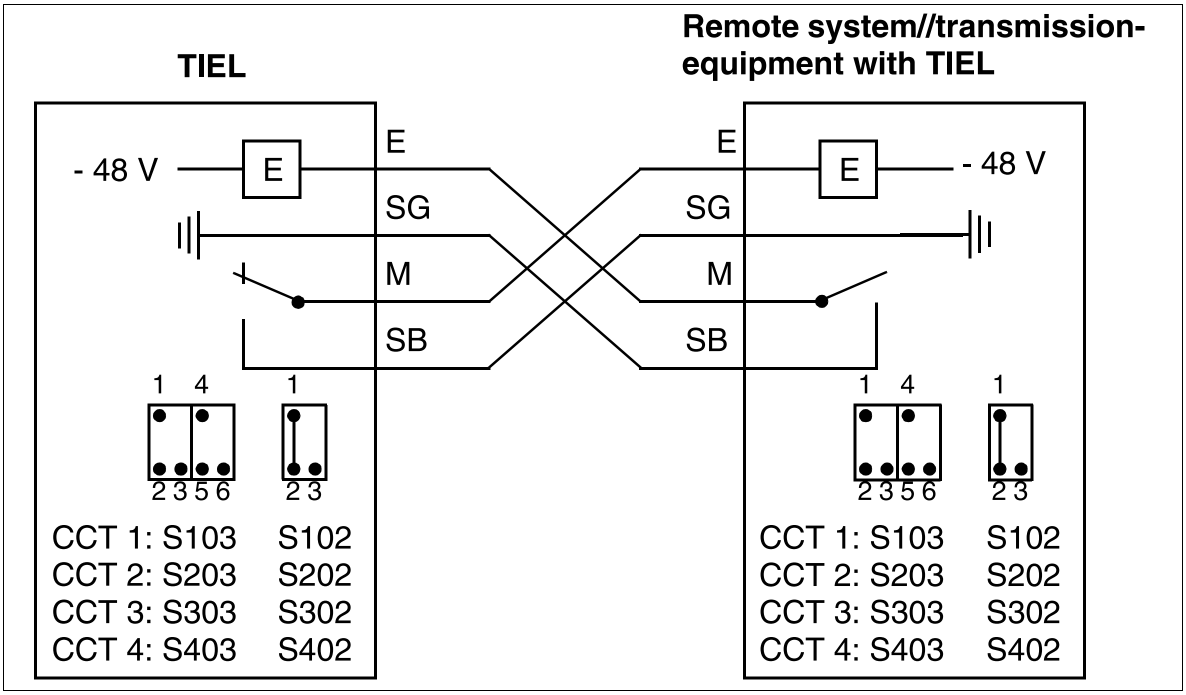
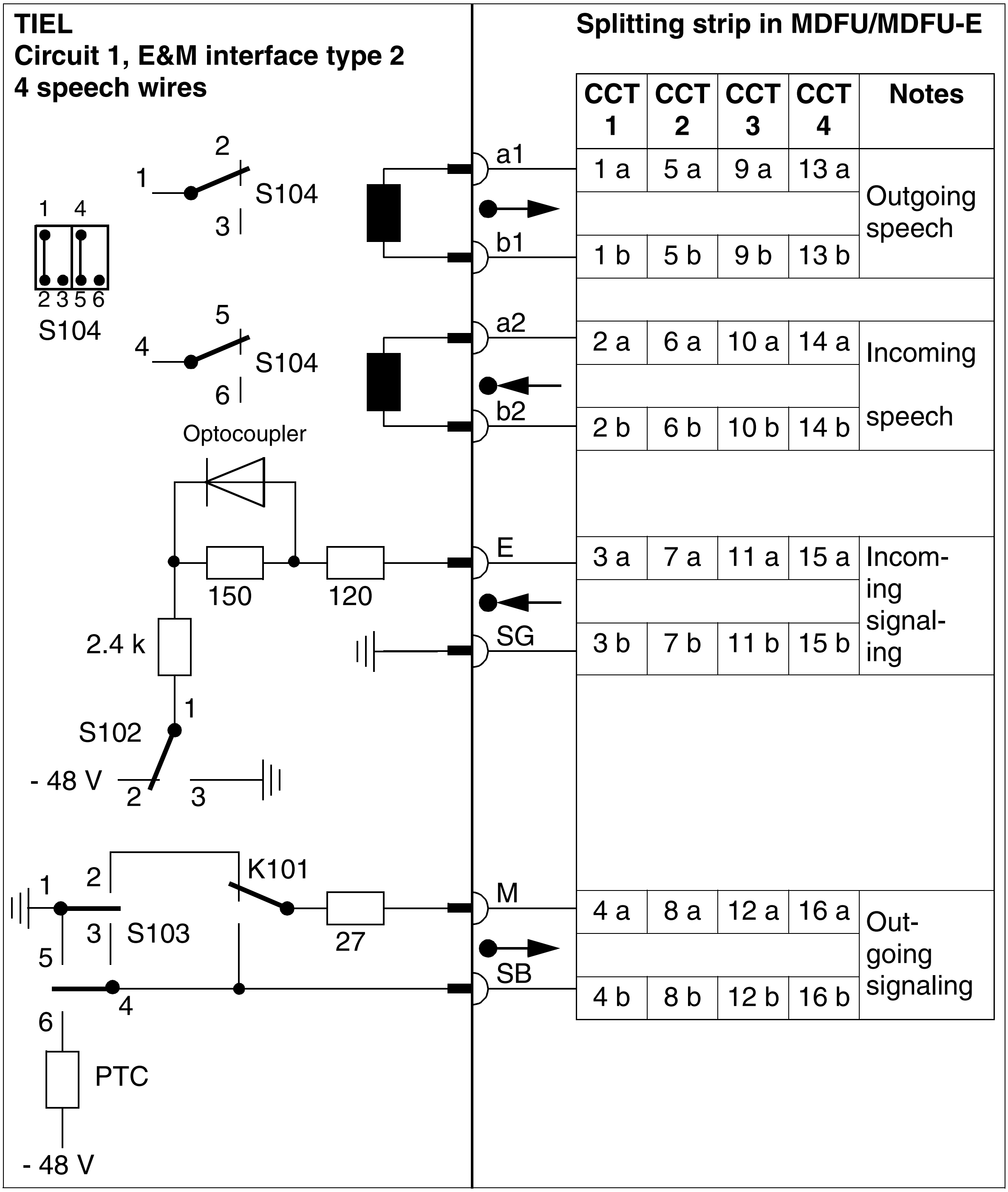

TIEL
Remote system//transmission-equipment with TIEL
- 48 V
E
E
SG
M
SB
1 4
1
2 3 5 6
2 3
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402
E
SG
M
SB
E
- 48 V
1 4
1
2 3 5 6
2 3
CCT 1: S103 S102
CCT 2: S203 S202
CCT 3: S303 S302
CCT 4: S403 S402

Figure 3-99 E&M Interface Type 2 (Not for U.S)

E&M interface type 2 - circuit diagram, MDFU or MDFU-E numbering (not for U.S.)


TIEL
Circuit 1, E&M interface type 2
4 speech wires
Splitting strip in MDFU/MDFU-E
S104
1
2
3
4
5
6
2 3 5 6
Optocoupler
150
120
2.4 k
S102
- 48 V
K101
S103
27
PTC
- 48 V
a1
b1
a2
b2
E
SG
M
SB

CCT 1	CCT 2	CCT 3	CCT 4	Notes
1 a	5 a	9 a	13 a	Outgoing speech
1 b	5 b	9 b	13 b	
2 a	6 a	10 a	14 a	Incoming speech
2 b	6 b	10 b	14 b	
3 a	7 a	11 a	15 a	Incoming signaling
3 b	7 b	11 b	15 b	
4 a	8 a	12 a	16 a	Outgoing signaling
4 b	8 b	12 b	16 b	

Figure 3-100 E&M Interface Type 2 - Circuit Diagram, MDFU or MDFU-E Numbering (Not for U.S.)

LED statuses and their meanings

Table 3-104 TIEL - LED Statuses

LED Status (on/off)	Meaning	Action
During Startup and Initialization		
Flickering (50/50 ms)	Board test unsuccessful	Replace board.
Flashing (100/ 100 ms)	Board not configured	Inspect visually, remove and re-insert board if necessary. Replace board if flashing continues.
On	Loading in progress	
Flashing (100/ 100 ms)	Code could not be loaded	Replace board.
Off	Board loaded	
Flashing (500/ 500 ms)	Board loaded but not yet activated	
During Operation		
On	Circuit seized	
Flashing in ring cadence	Circuit in ringing state	
Flickering (450/ 50 ms)	Dependability test (loopback test) in progress	
Flashing (500/ 500 ms)	Circuit out of service (e.g. S1/x in “on” position”)	Check whether the circuit was deactivated with HiPath 3000 Manager E or lockout switch.
Off	Circuit is idle, no seizure	

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Assignment must be coordinated with the remote system.

Table 3-105 TIEL - Cable Assignment (Not for U.S.)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	TIEL		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes	
				BP: Xx8						
1	1	wht/blu		19	1ka	Port 1	1a	5	Ring	- Transmit with 4-wire speech - Transmit + receive with 2-wire speech
			blu/wht	39	1kb		1b	4	Tip	
	2	wht/ora		38	1ga		2a	6	Ring	Receive with 4-wire speech
			ora/wht	48	1gb		2b	3	Tip	
	3	wht/grn		27	1E		3a	1	Ear	Signal wires
			grn/wht	47	1SG		3b	2	System ground	
	4	wht/brn		16	1M		4a	7	Mouth	
			brn/wht	46	1SB		4b	8	System battery	
	5	wht/gry		05	2ka	Port 2	5a	5	Ring	- Transmit with 4-wire speech - Transmit + receive with 2-wire speech
			gry/wht	45	2kb		5b	4	Tip	
2	6	red/blu		14	2ga		6a	6	Ring	Receive with 4-wire speech
			blu/red	44	2gb		6b	3	Tip	
	7	red/ora		23	2E		7a	1	Ear	Signal wires
			ora/red	43	2SG		7b	2	System ground	
	8	red/grn		32	2M		8a	7	Mouth	
			grn/red	42	2SB		8b	8	System battery	

Table 3-105 TIEL - Cable Assignment (Not for U.S.)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	TIEL		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes	
				BP: Xx8						
2	9	red/brn		11	3ka	Port 3	9a	5	Ring	● Transmit with 4-wire speech ● Transmit + receive with 2-wire speech
			brn/red	31	3kb		9b	4	Tip	
	10	red/gry		02	3ga		10a	6	Ring	Receive with 4-wire speech
			gry/red	22	3gb		10b	3	Tip	
3	11	blk/blu		13	3E		11a	1	Ear	Signal wires
			blu/blk	33	3SG		11b	2	System ground	
	12	blk/ora		04	3M		12a	7	Mouth	
			ora/blk	24	3SB		12b	8	System battery	
	13	blk/grn		15	4ka	Port 4	13a	5	Ring	● Transmit with 4-wire speech ● Transmit + receive with 2-wire speech
			grn/blk	35	4kb		13b	4	Tip	
	14	blk/brn		06	4ga		14a	6	Ring	Receive with 4-wire speech
			brn/blk	26	4gb		14b	3	Tip	
	15	blk/gry		17	4E		15a	1	Ear	Signal wires
			gry/blk	37	4SG		15b	2	System ground	
4	16	yel/blu		08	4M		16a	7	Mouth	
			blu/yel	28	4SB		16b	8	System battery	

Table 3-106 TIEL - Assignment (SU Xx8) (For U.S. Only)

#	a-Wire (Tip)	b-Wire (Ring)	SU connector	TIEL		CHAMP jack, MDF		Notes
			BP: Xx8					
1	wht/blu		19	1Ra	Port 1	1	Ring	- Transmit with 4-wire speech - Transmit + receive with 2-wire speech
		blu/wht	39	1Rb		26	Tip	
2	wht/ora		38	1Sa		2	Ring 1	Receive with 4-wire speech
		ora/wht	48	1Sb		27	TIP 1	
3	wht/grn		27	2Ra		3	E	Signal wires
		grn/wht	47	2Rb		28	System ground	
4	wht/brn		16	2Sa		4	M	
		brn/wht	46	2Sb		29	System battery	
5	wht/gry		05	3Ra	Port 2	5	Ring	- Transmit with 4-wire speech - Transmit + receive with 2-wire speech
		gry/wht	45	3Rb		30	Tip	
6	red/blu		14	3Sa		6	Ring 1	Receive with 4-wire speech
		blu/red	44	3Sb		31	TIP 1	
7	red/ora		23	4Ra		7	E	Signal wires
		ora/red	43	4Rb		32	System ground	
8	red/grn		32	4Sa		8	M	
		grn/red	42	4Sb		33	System battery	
9	red/brn		11	5Ra	Port 3	9	Ring	- Transmit with 4-wire speech - Transmit + receive with 2-wire speech
		brn/red	31	5Rb		34	Tip	
10	red/gry		02	5Sa		10	Ring 1	Receive with 4-wire speech
		gry/red	22	5Sb		35	TIP 1	
11	blk/blu		13	6Ra		11	E	Signal wires
		blu/blk	33	6Rb		36	System ground	
12	blk/ora		04	6Sa		12	M	
		ora/blk	24	6Sb		37	System battery	

Table 3-106 TIEL - Assignment (SU Xx8) (For U.S. Only)

#	a-Wire (Tip)	b-Wire (Ring)	SU connector	TIEL		CHAMP jack, MDF		Notes
			BP: Xx8					
13	blk/grn		15	7Ra	Port 4	13	Ring	- Transmit with 4-wire speech - Transmit + receive with 2-wire speech
		grn/blk	35	7Rb		38	Tip	
14	blk/brn		06	7Sa		14	Ring 1	Receive with 4-wire speech
		brn/blk	26	7Sb		39	TIP 1	
15	blk/gry		17	8Ra		15	E	Signal wires
		gry/blk	37	8Rb		40	System ground	
16	yel/blu		08	8Sa		16	M	
		blu/yel	28	8Sb		41	System battery	
No other wires used.								

3.3.25 TLA2 (Not for U.S.), TLA4 (Not for U.S.), TLA8 (Not for U.S.)

Introduction

The MSI boards TLA2, TLA4 and TLA8 provide 2, 4 and 8 analog trunks (DP and DTMF dialing method) for HiPath 3550 and HiPath 3350 (wall housing).

Interfaces

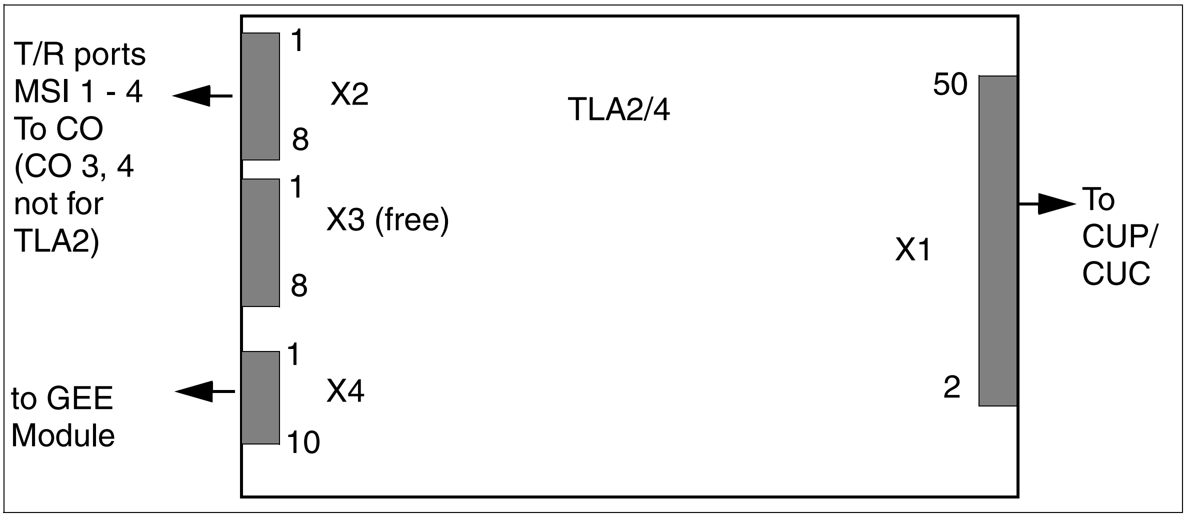

T/R ports
MSI 1 - 4
To CO
(CO 3, 4
not for
TLA2)
1
X2
8
1
X3 (free)
8
1
X4
10
to GEE
Module
TLA2/4
50
X1
2
To
CUP/
CUC

Figure 3-101 TLA2, TLA4 (Not for U.S.) - Interfaces (S30817-Q923-Bxxx, -Axxx)

Table 3-107 TLA2, TLA4 (Not for U.S.) - Contact Assignments

Contact	Connector X2	Connector X4
1	a trunk 1	GND for GEE50 FKR, otherwise free
2	b trunk 1	b trunk 1
3	a trunk 2	a trunk 1
4	b trunk 2	b trunk 2
5	a trunk 3[1]	a trunk 2
6	b trunk 3[1]	b trunk 3[1]
7	a trunk 4[1]	a trunk 3[1]
8	b trunk 4[1]	b trunk 4[1]
9		a trunk 4[1]
10		Call charging module assignment (GMZ)

[1] Not for TLA2

The MSI board TLA8 with eight analog trunks for DP and DTMF signalling in HiPath 3550 and HiPath 3350.

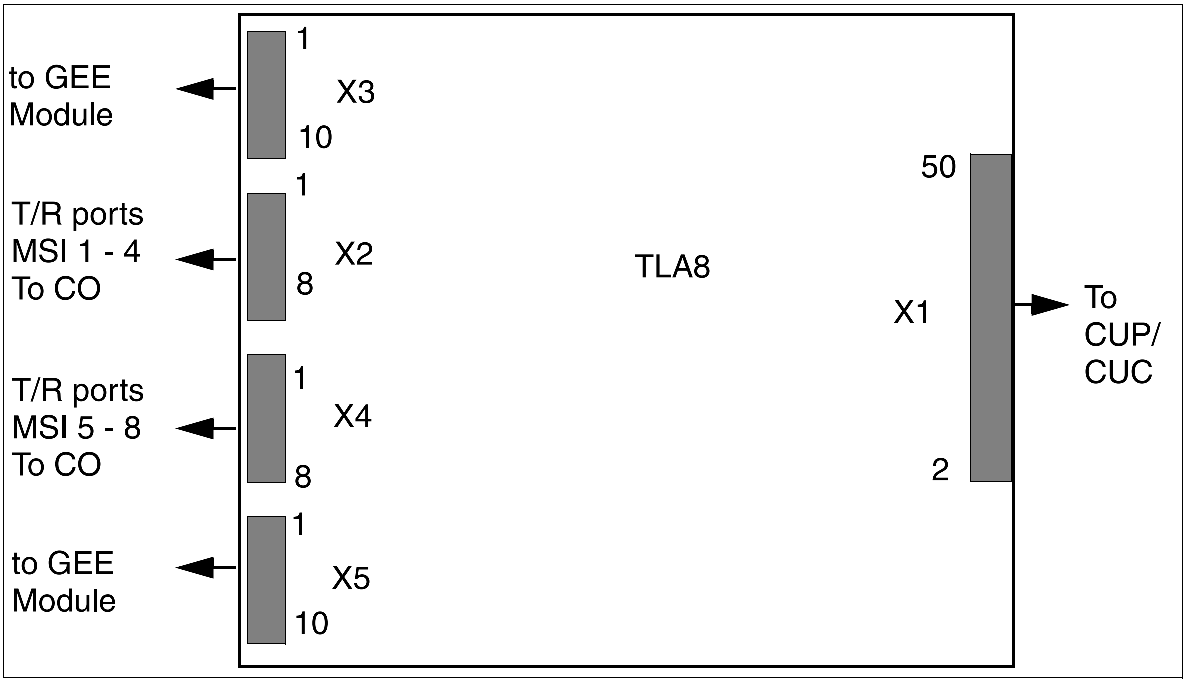

to GEE Module
T/R ports MSI 1 - 4 To CO
T/R ports MSI 5 - 8 To CO
to GEE Module
1
X3
10
1
X2
8
1
X4
8
1
X5
10
TLA8
50
X1
2
To CUP/ CUC

Figure 3-102 TLA8 (Not for U.S.) - Interfaces (S30817-Q926-Axxx)

Table 3-108 TLA8 (Not for U.S.) - Contact Assignments

Contact	Connector X3	Connector X2	Connector X4	Connector X5
1	GND	a trunk 1	a trunk 5	GND
2	b trunk 1	b trunk 1	b trunk 5	b trunk 5
3	a trunk 1	a trunk 2	a trunk 6	a trunk 5
4	b trunk 2	b trunk 2	b trunk 6	b trunk 6
5	a trunk 2	a trunk 3	a trunk 7	a trunk 6
6	b trunk 3	b trunk 3	b trunk 7	b trunk 7
7	a trunk 3	a trunk 4	a trunk 8	a trunk 7
8	b trunk 4	b trunk 4	b trunk 8	b trunk 8
9	a trunk 4	–	–	a trunk 8
10	GMZ 1	–	–	GMZ 2
GMZ= Call charging module assignment GND=GND for GEE50 FKR, otherwise free				

3.3.26 TLA4R (Not for U.S.)

Introduction

The TLA4R (**T**runk **L**ine **A**nalog **R**ack) board provides four ports for the analog trunk connection (DP and DTMF signaling methods) on HiPath 3500 and HiPath 3300 (19-inch housing). There are also two ALUM power failure transfers.

The transmission and function-oriented characteristics of the TLA4R are completely identical to those of the TLA boards that are used in HiPath 3550 and HiPath 3350. The only differences are

- the two ALUMs which are only available on the TLA4R.
- the call metering receiving equipment interface, which is only on the TLA boards.

Interfaces

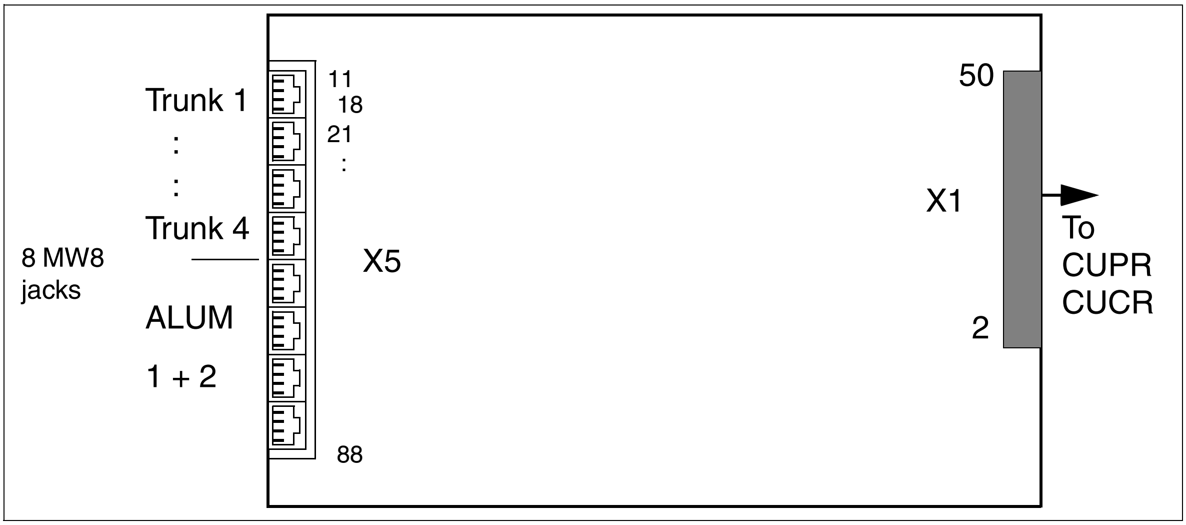


Figure 3-103 TLA4R (Not for U.S.) Interfaces (S30817-Q923-Zxxx)

Table 3-109 TLA4R (Not for U.S.) Contact Assignments

MW8 Jack	X5, pin	Trunk connections 1-4
1	14	a trunk 1
	15	b trunk 1
2	24	a trunk 2
	25	b trunk 2

Table 3-109 TLA4R (Not for U.S.) Contact Assignments

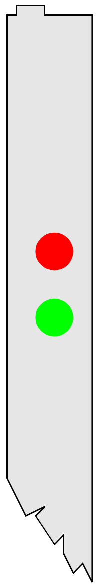
3	34	a trunk 3	
	35	b trunk 3	
4	44	a trunk 4	
	45	b trunk 4	
MW8 Jack	**X5, pin**	**ALUM 1 + 2**	
5	54	TB1	ALUM1: Stn card connection
	55	TA1	
6	64	TB2	ALUM2: Stn card connection
	65	TA2	
7	74	BE1	ALUM1: Analog telephone connection
	75	AE1	
8	84	BE2	ALUM2: Analog telephone connection
	85	AE2	

3.3.27 TM2LP

Introduction

The TM2LP (**T**runk **M**odule **L**oop **P**rocedure) board connects up to eight analog trunks to HiPath 3800 using the loop-start protocol.

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-104 TM2LP - Front Panel (S30810-Q2159-Xxxx)

> To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

LED statuses and their meanings

Table 3-110 TM2LP - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-111
- For connecting to the connector panels using RJ45 jacks: Table 3-112
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-113
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-114

Table 3-111 TM2LP - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	TM2LP		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17		Free		
		brn/red	18				
10	red/gry		19		Free		
		gry/red	20				
11	blk/blu		24		Free		
		blu/blk	25				
12	blk/ora		26		Free		
		ora/blk	27				
13	blk/grn		29		Free		
		grn/blk	30				
14	blk/brn		31		Free		
		brn/blk	32				
15	blk/gry		34		Free		
		gry/blk	35				
16	yel/blu		37		Free		
		blu/yel	38				

Table 3-112 TM2LP - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		TM2LP	Notes
No.	Pin		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4		Free
	5		
10	4		Free
	5		
11	4		Free
	5		
12	4		Free
	5		
13	4		Free
	5		
14	4		Free
	5		
15	4		Free
	5		
16	4		Free
	5		

Table 3-112 TM2LP - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		**TM2LP**	**Notes**
No.	**Pin**		
17	4		Free
	5		
18	4		Free
	5		
19	4		Free
	5		
20	4		Free
	5		
21	4		Free
	5		
22	4		Free
	5		
23	4		Free
	5		
24	4		Free
	5		

Table 3-113 TM2LP - Connector Panel Assignment with CHAMP Jack (For U.S. Only)

CHAMP jack	TM2LP			Notes
1	1a	1 Ring	Port 1	
26	1b	1 TIP		
2	2a	2 Ring	Port 2	
27	2b	2 TIP		
3	3a	3 Ring	Port 3	
28	3b	3 TIP		
4	4a	4 Ring	Port 4	
29	4b	4 TIP		
5	5a	5 Ring	Port 5	
30	5b	5 TIP		
6	6a	6 Ring	Port 6	
31	6b	6 TIP		
7	7a	7 Ring	Port 7	
32	7b	7 TIP		
8	8a	8 Ring	Port 8	
33	8b	8 TIP		
9			Free	
34				
10			Free	
35				
11			Free	
36				
12			Free	
37				
13			Free	
38				
14			Free	
39				
15			Free	
40				
16			Free	
41				

Table 3-114 TM2LP - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	TM2LP		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

3.3.28 TMAMF (for selected countries only)

Introduction

The TMAMF (**T**runk **M**odule **A**nalog for **M**ulti**F**requency Code Signaling) board contains eight trunks for analog direct inward dialing. The system supports MFC-R2 signaling (default setting), MFC-R2 with caller ID, tone dialing, and dial pulsing. It is not possible to use DTMF and MFC-R2 (with or without caller ID) simultaneously.

There are two versions of this board:

- S30810-Q2587-A200 for use in HiPath 3750 and HiPath 3700.
- S30810-Q2587-A400 for use in HiPath 3550.

Switches and LEDs

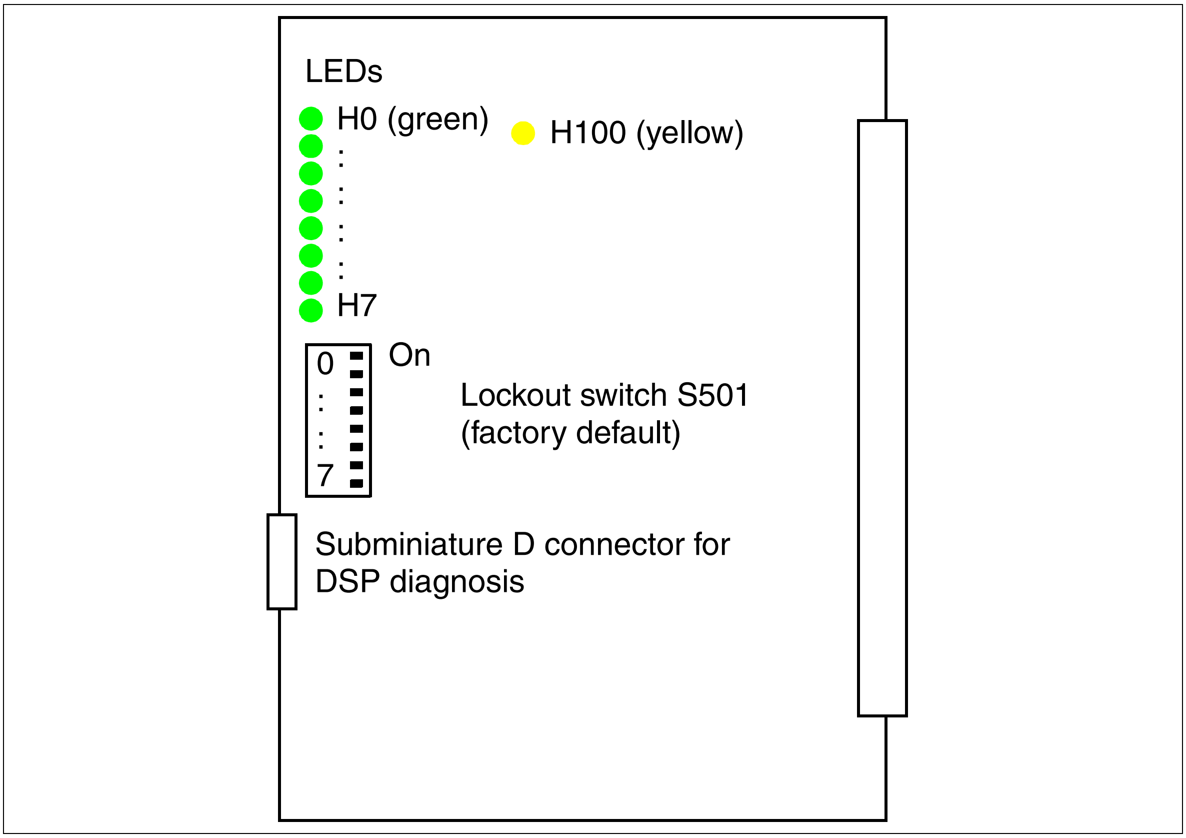

LEDs
H0 (green)
:
:
:
:
H7
H100 (yellow)
0
:
:
7
On
Lockout switch S501 (factory default)
Subminiature D connector for DSP diagnosis

Figure 3-105 TMAMF (S30810-Q2587-Axxx)

Notes on DSP diagnosis

You can use the trace function built into the TMAMF module to diagnose malfunctions or obtain more precise error analysis. The subminiature D connector provides information about MFC-R2 signaling. To activate the trace function, you must connect a PC with a terminal emulation program (such as Microsoft HyperTerminal).

Terminal configuration:

- Bits per second = 19,200
- Data bits = 8
- Stop bit = 1
- Parity = none
- Flow control = none

Pin assignments of the diagnostic cable

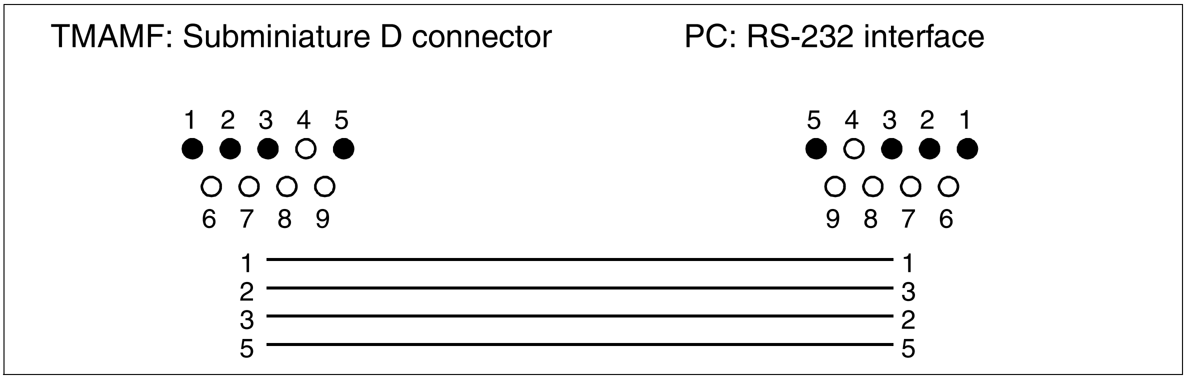

TMAMF: Subminiature D connector
PC: RS-232 interface
1 2 3 4 5
6 7 8 9
5 4 3 2 1
9 8 7 6
1 — 1
2 — 3
3 — 2
5 — 5

Figure 3-106 Pin Assignments of the TMAMF Diagnostic Cable

LED statuses and their meanings

- H100 LED (see Figure 3-105): signal processor status

Table 3-115 TMAMF - LED Statuses (H100)

LED Status (on/off)	Meaning	Action
During Startup and Initialization		
Off	–	
Flashing (250/250 ms)	The DSP (digital signal processor) is waiting for DID digits	
On	The DSP is being reset	
During Operation		
Off	The DSP is idle	
Flashing (250/250 ms)	Error: the DSP has not yet received the DID digits.	Replace board.
On	The MFC-R2 filter is on	

- LEDs H0 to H7 (see Figure 3-105): trunk status

Table 3-116 TMAMF - LED Statuses (H0 to H7)

LED Status (on/off)	Meaning	Action
During Operation		
Off	The trunk is idle; no seizure	
On	The trunk was seized	
Flashing (500/500 ms)	Trunk out of service (e.g. S1/x “closed”)	Check whether the trunk was deactivated using HiPath 3000 Manager E or the lockout switch.

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-117 TMAMF - Cable Assignment

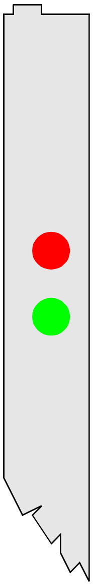
Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	TMAMF		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes
				BP: Xx8					
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

3.3.29 TMC16 (U.S. Only)

Introduction

The trunk module TMC16 (**T**runk **M**odule **C**entral Office) connects up to 16 analog ground-start or loop-start trunks with the HiPath 3800.

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-107 TMC16 (for U.S. only) (S30810-Q2485-X) - Front Panel

> To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

LED statuses and their meanings

Table 3-118 TMC16 (for U.S. only) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-119
- For connecting to the connector panels with CHAMP jack: Table 3-120
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-121

Table 3-119 TMC16 (for U.S. only) - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	TMC16		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-120 TMC16 (For U.S. Only) - Connector Panel Assignment with CHAMP Jack

CHAMP jack	TMC16			Notes
1	1a	1 Ring	Port 1	
26	1b	1 TIP		
2	2a	2 Ring	Port 2	
27	2b	2 TIP		
3	3a	3 Ring	Port 3	
28	3b	3 TIP		
4	4a	4 Ring	Port 4	
29	4b	4 TIP		
5	5a	5 Ring	Port 5	
30	5b	5 TIP		
6	6a	6 Ring	Port 6	
31	6b	6 TIP		
7	7a	7 Ring	Port 7	
32	7b	7 TIP		
8	8a	8 Ring	Port 8	
33	8b	8 TIP		
9	9a	9 Ring	Port 9	
34	9b	9 TIP		
10	10a	10 Ring	Port 10	
35	10b	10 TIP		
11	11a	11 Ring	Port 11	
36	11b	11 TIP		
12	12a	12 Ring	Port 12	
37	12b	12 TIP		
13	13a	13 Ring	Port 13	
38	13b	13 TIP		
14	14a	14 Ring	Port 14	
39	14b	14 TIP		
15	15a	15 Ring	Port 15	
40	15b	15 TIP		
16	16a	16 Ring	Port 16	
41	16b	16 TIP		

Table 3-121 TMC16 (for U.S. only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	TMC16		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

3.3.30 TMCAS (for selected countries only)

Introduction

For V1.0 and later, TMCAS (**T**runk **M**odule **C**hannel **A**ssociated **S**ignaling) boards can be used in HiPath 3750, HiPath 3700, and HiPath 3550 to support the country-specific CAS protocol.

The board converts the Euro-ISDN protocol on an S_{2M} link into the Channel Associated Signaling (CAS) protocol. The board functions only in connection with a TMS2 (HiPath 3750, HiPath 3700) or TS2 (HiPath 3550). There is no direct connection between the TMCAS board and the system's central control unit. The TMS2/TS2 handles all signaling and data traffic.

Switches and display

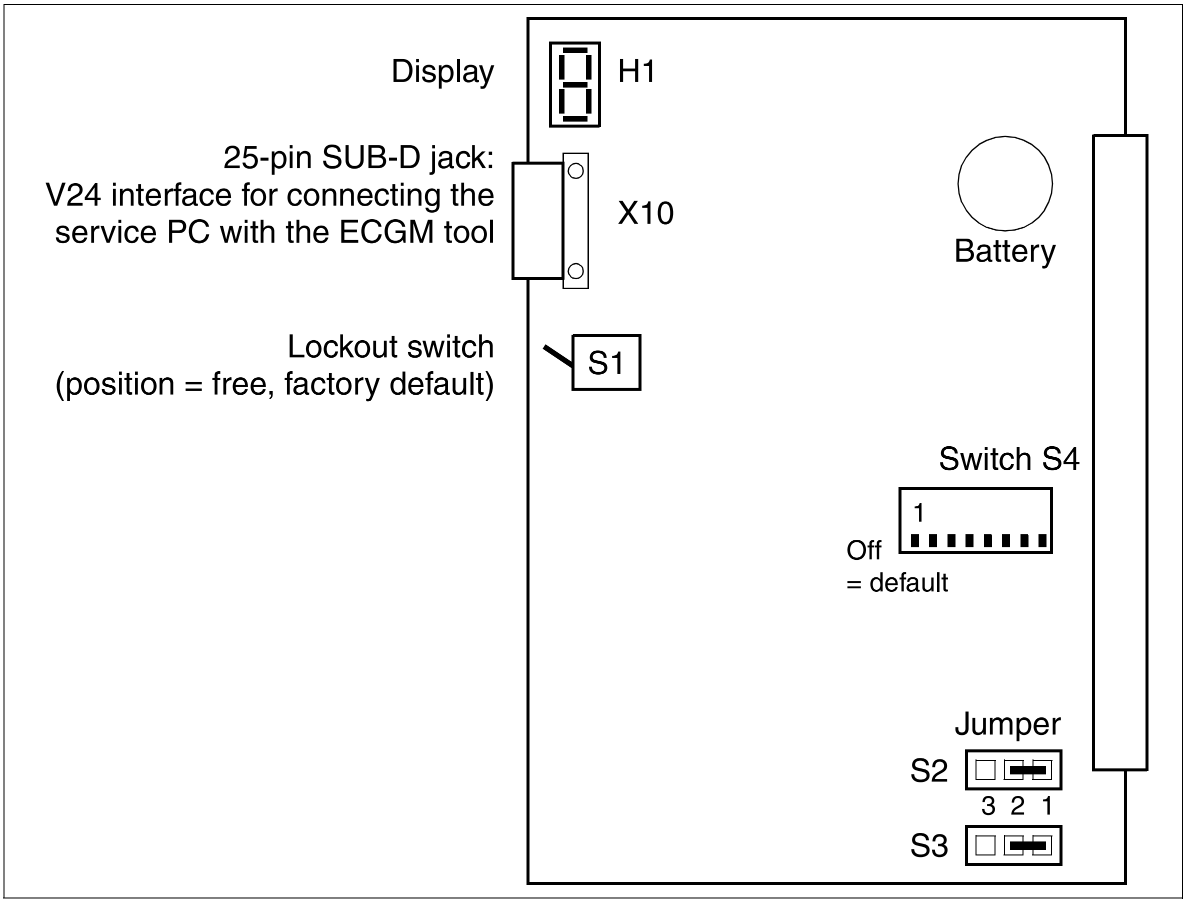

Display
H1
25-pin SUB-D jack:
V24 interface for connecting the
service PC with the ECGM tool
X10
Battery
Lockout switch
(position = free, factory default)
S1
Switch S4
1
Off
= default
Jumper
S2
3 2 1
S3

Figure 3-108 TMCAS (S30810-Q2938-X)

Administration of the CAS protocol converter

Use the ECGM tool for administration. For information on installing the software on the service PC and on the required settings, see Page 3-270.

You can use the C39195-Z7267-C13 cable for the connection between jack X10 and the service PC.

Switches S4-1 to S4-4 for setting the impedance

To ensure that the TMCAS works properly, the same impedance must be selected both on the S_{2M} side of the TMCAS and on the TMS2 (HiPath 3750, HiPath 3700) or TS2 (HiPath 3550) board.

Impedance on the CAS Side	**Switch settings**	
	S4-1	**S4-2**
120 ohms (default)	Off	Off
100 ohms	On	Off
75 ohms	Off	On
No function	On	On
Impedance on the S_{2M} Side	**Switches**	
	S4-3	**S4-4**
120 ohms (default)	Off	Off
100 ohms	On	Off
75 ohms	Off	On
No function	On	On

Switches S4-5 to S4-8

Switches	**Function**
S4-5	Reserved
S4-6	Flash memory: only for laboratory purposes (the flash memory is erased when switch is set to “On”).
S4-7	Reserved
S4-8	Battery: Select the “On” switch position to make the connection to the processor’s real-time clock only after the protocol converter has been configured.

Jumpers S2 and S3 for GND connection

You can set the GND connection (signal ground) of the receiving (Rx) and transmitting (Tx) lines on the CAS side here.

GND connection	Jumper setting
no signal ground (default)	S2 = 1 - 2, S3 = 1 - 2
signal ground on receive lines (Rx) on the CAS side	S2 = 2 - 3
signal ground on the transmit lines (Tx) on the CAS side	S3 = 2 - 3

Recommendations for the GND connection:

- symmetric line (120 ohms)
  Ground the cable’s shield on the side of the connected device (NT, MUX, modem).
- coaxial line (75 ohms)
  Do not ground the shield on both ends of the cable.
  - Tx: Ground the cable’s shield on the TMCAS side.
  - Rx: Ground the cable’s shield on the side of the connected device (NT, MUX, modem).

Seven-segment display H1

The board statuses listed in the following table are displayed on H1.

Table 3-122 TMCAS - Seven-Segment Display H1

Display	Meaning
0	Waiting for the TMCAS software download
1	TMCAS software download start
3	TMCAS software download
7	Writing the TMCAS software/extender software into the flash memory
8	Loading the TMCAS software/extender software from the flash memory
E	Waiting for ECGM command (10 s)
F	Calculating the checksum
H	No TMCAS software in the flash memory, waiting for reload
F E	Flash memory erased (changing display)
A	TMCAS board active
]	TMCAS board active, boot process completed

TMCAS in HiPath 3750 and HiPath 3700

A maximum of four TMCAS boards can be used in the HiPath 3750 and HiPath 3700. For power supply reasons, a maximum of two TMCAS are possible for one cabinet. Because the board does not need a PCM highway, there are no restrictions concerning the 64 time-division multiplex channels per PCM segment. However, TMCAS must always be plugged in to the left of the associated TMS2. An example of a TMCAS in the HiPath 3750 and HiPath 3700 cabinet is shown in Figure 3-109.

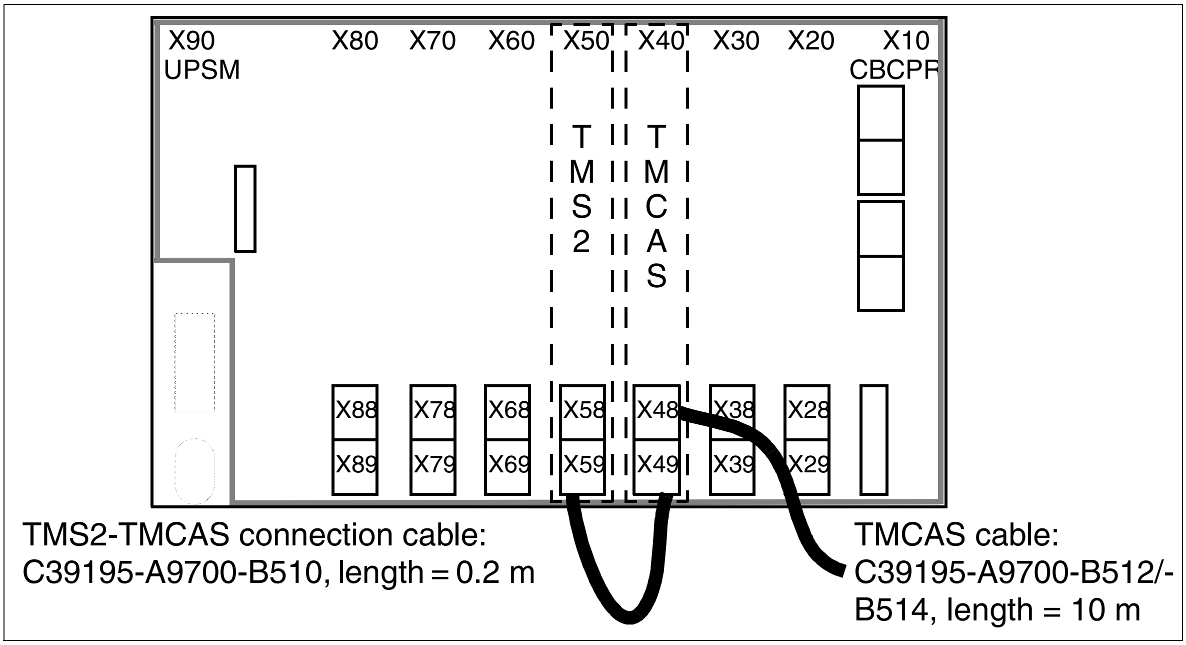

X90
UPSM
X80
X70
X60
X50
X40
X30
X20
X10
CBCPR
TMS2
TMCAS
X88
X78
X68
X58
X48
X38
X28
X89
X79
X69
X59
X49
X39
X29
TMS2-TMCAS connection cable:
C39195-A9700-B510, length = 0.2 m
TMCAS cable:
C39195-A9700-B512/-B514, length = 10 m

Figure 3-109 TMCAS in HiPath 3750 and HiPath 3700 - Backplane View of the “8-Slot” Basic Cabinet

Table 3-123 Assignment of the TMS2-TMCAS Connection Cable C39195-A9700-B510

SU connector Xx9, pin	Function
6	a-wire (T), receive
26	b-wire (R), receive
2	a-wire (T), transmit
22	b-wire (R), transmit
33	+5 V for board detection
35	+5 V (reserved)
4	GND

Page 3-268 has information on the assignments for the two C39195-A9700-B512, -B514 TMCAS cables.

TMCAS in HiPath 3550

TMCAS can be used only in slot 10 of the wall housing.

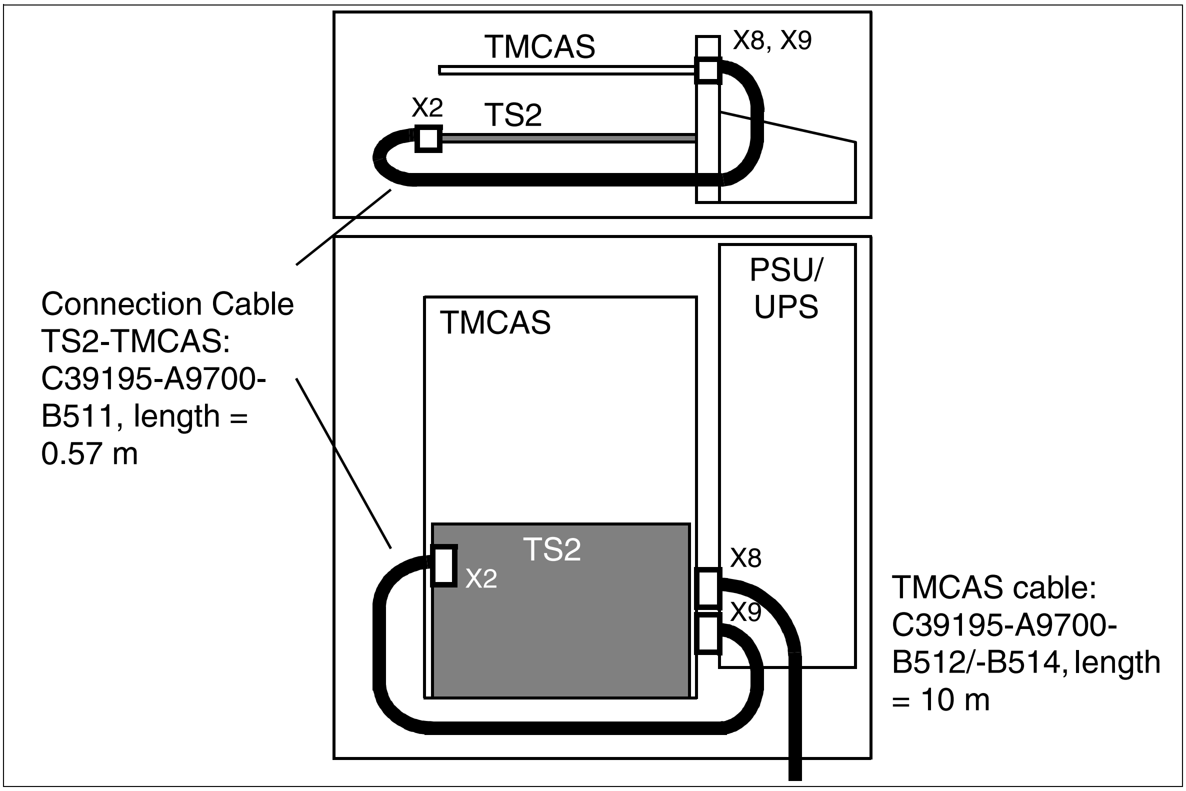

TMCAS
X8, X9
X2
TS2
Connection Cable TS2-TMCAS: C39195-A9700-B511, length = 0.57 m
PSU/ UPS
TMCAS
TS2
X2
X8
X9
TMCAS cable: C39195-A9700-B512/-B514, length = 10 m

Figure 3-110 TMCAS in HiPath 3550

Table 3-124 Assignment of the TS2-TMCAS Connection Cable C39195-A9700-B511

TS2 Wieland terminal X2, pin	Function	TMCAS SU connector X9, pin
1, 2, 3	–	–
4	+5 V for board detection	33
5	a-wire (T), receive	6
6	b-wire (R), receive	26
7	a-wire (T), transmit	2
8	b-wire (R), transmit	22

Page 3-268 has information on the assignments for the two C39195-A9700-B512, -B514 TMCAS cables.

Assignments for the two TMCAS cables for HiPath 3750, HiPath 3700, and HiPath 3550

You can use one of the following two cables to connect the network terminator NT, multiplexer MUX, or modem to the TMCAS board:

- symmetric line (120 ohms)

Table 3-125 Assignment of the TMCAS Cable C39195-A9700-B512

SU connector Xx8, pin	Function	Color code
2	a-wire (T), receive	grn
22	b-wire (R), receive	blk
6	a-wire (T), transmit	red
26	b-wire (R), transmit	blk

- coaxial line (75 ohms)

Table 3-126 Assignment of the TMCAS Cable C39195-A9700-B514

SU connector Xx8, pin	Function	Wire
2	a-wire (T), receive	BNC shield, cable 1
22	b-wire (R), receive	BNC signal, cable 1
6	a-wire (T), transmit	BNC shield, cable 2
26	b-wire (R), transmit	BNC signal, cable 2

Procedure for retrofitting a TMCAS board

Step	Activity
1.	Disconnect system from power supply and open system.
2.	Insert TMS2 (HiPath 3750 and HiPath 3700) or TS2 (HiPath 3550).
3.	● HiPath 3750 and HiPath 3700: Insert TMCAS next to the TMS2, on the left. ● HiPath 3550 (wall housing): Insert TMCAS in slot 10.
4.	Plug in TMS2/TS2-TMCAS connection cable.
5.	Connect the NT to the system using the TMCAS cable.
6.	Close the system and connect it to the power supply.
7.	After the system has booted, both boards are entered in the system's database (TMS2 or TS2 and TMCAS).
8.	If necessary, configure with HiPath 3000 Manager E.
Possible problems: ● TMCAS not entered in HiPath 3000 Manager E The TMCAS is displayed automatically after the generation/regeneration of the database in a system with a correctly inserted and connected TMCAS-TMS2/TS2 combination. ● Missing electrical connection between TMS2/TS2 and TMCAS No TMCAS entry in the database. If a correctly configured database (with TMCAS inserted offline) is then loaded into the system using generation/regeneration, the TMCAS configured in HiPath 3000 Manager E appears only in the SW configuration. ● Incompatible board configuration There is a correctly inserted TMCAS-TMS2/TS2 combination in the system. If there is a different board entered in HiPath 3000 Manager E immediately to the left of the TMS2 (HiPath 3750 and HiPath 3700) or in the HiPath 3550's large slot, the generation is rejected.	

Installing the ECGM tool and configuring the CAS protocol converter

This section contains information on installing the ECGM tool on the service PC and for configuring the CAS protocol converter on the TMCAS board.

The ECGM tool supports the following actions:

- Extender, database and software download
- CAS protocol configuration
- Database programming
- Trace options

Procedure

Step	Activity
1.	Create directory `c:\ecginst` on the service PC .
2.	Set up the connection to the download server (for information on this, contact your local ITSC) and copy the following files into the directory `c:\ecginst`: ● `e1v0xx.exe` (for example, `e140ah.exe`) ● `Ee1v0yy.exe` (for example, `Ee140am.exe`) ● `Ecgm_vzz.exe` (for example `Ecgm_4aa.exe`) Explanation of the variables: ● `v =` software version ● `xx =` country version of a file ● `yy =` file version for channels ● `zz =` file version for maintenance
3.	Run .exe files. This will extract the following files, for example: ● `Ecgm.cab` (WinZip file) ● `Setup.lst` (LST file) ● `Setup.exe` (EXE file) ● `4brazil.iam` (IAM file) ● `Ecg_edb4.ein` (EIN file) ● `4brazil.eam` (EAM file) ● `E140ah.sin` (SIN file) ● `E140ah.pnm` (PNM file) ● `X140pai.pnm` (PNM file) ● `X130aq.pnm` (PNM file)
4.	Execute `Setup.exe` file. This will create the directory `ecgm` and extract various files.
5.	Copy `vbrazil.iyy` (for example, `4brazil.iam`) to the directory `ecgm`.
6.	Run the file `ecgm.exe`.

Step	Activity
7.	Make the following settings in the ECGM tool: ● `File/Options` menu: Select the service PC’s COM interface (for example: COM1) ● `File/Install Software` menu: Select the file `E1v0xx.pnm` (for example, `E140ah.pnm` from the directory `ecginst`. ● `File/Install Edb` menu: Select the file `Ecg_edbv.ein` (for example `Ecg_edb4.ein`) from the directory ecginst. ● `File/Update Site` menu: – Under ECG SOFTWARE, select loadware file `E1v0xx.pnm`. – Under “ECG EDB”, select file `vbrazil.iyy`. – Under “FILE NAME”, select file extension `.db` for logging TMCAS events. – Enter the customer name under "ECG NAME".
8.	Close the ECGM tool and then restart (`ecgm.exe`).
9.	Enter the COM interface under “COMM” and the customer name in the `Settings/ECG Name` menu. All other windows are updated automatically.
10.	Channel configuration Define the channel parameters in the `View/Database` menu (reserve unused channels with "Out of Service".): ● Protocol ● Signaling method (incoming and outgoing) ● Clock master (always central office) ● Operator number (corresponds to the number of the attendant console of the HiPath 3000)
11.	Software download If the seven-segment display H1 on the TMCAS displays “H”, it is necessary to download the extender software (`Download/Extender` menu). Otherwise, continue with the next step.
12.	Start the software/database download using the `Download/Software and Database` menu. This procedure takes approximately 8 minutes. The download is complete when the configured channels display the “Idle” status. The seven-segment display H1 on the TMCAS shows “A” (= active).

3.3.31 TMDID (for U.S. only)

Introduction

The TMDID board (**T**runk **M**odule **D**irect **I**nward **D**ialing) provides direct inward dialing from the central office (CO) to HiPath 3800.

The board has eight trunk circuits that connect to analog trunks.

The circuits can be set up for immediate start or wink start.

> The peripheral board slots on the HiPath 3800 are fitted with SIPAC 9 SU connectors. Since the TMDID board has SIVAPAC connector strips, you will have to install a SIVAPAC-SIPAC board adapter in order to be able to use it in HiPath 3800.
> For information on upgrade procedures, please see Section 4.2.5.4.

Switches

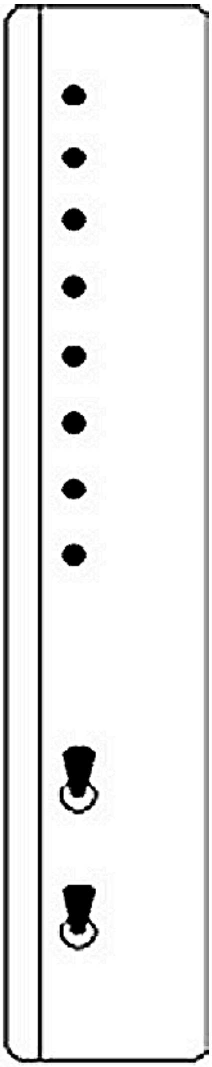
- Switches for manual trunk selection. In this case, all trunks are filtered one after the other until the LED of the desired trunk flashes.
- Lockout switch which can be used to manually block the selected trunk circuit.

LED statuses and their meanings

Table 3-127 TMDID (For U.S. Only) - LED Statuses

LED status 0 - 7	Meaning
Off	The trunk circuit is free.
On	The trunk circuit is assigned.
Slow flashing	The trunk circuit was deactivated by the software.
Fast flashing	The switch was pressed and the trunk circuit was selected for manual activation or deactivation.

Front panel



LEDs (green) for displaying the trunk status:

- Trunk circuit 0
- Trunk circuit 1
- Trunk circuit 2
- Trunk circuit 3
- Trunk circuit 4
- Trunk circuit 5
- Trunk circuit 6
- Trunk circuit 7

Switch

Lockout switch

Figure 3-111 TMDID (for U.S. only) (S30810-Q2452-X) - Front Panel

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-128
- For connecting to the connector panels with CHAMP jack: Table 3-129
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-130

Table 3-128 TMDID (for U.S. only) - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	TMDID		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17		Free		
		brn/red	18				
10	red/gry		19		Free		
		gry/red	20				
11	blk/blu		24		Free		
		blu/blk	25				
12	blk/ora		26		Free		
		ora/blk	27				
13	blk/grn		29		Free		
		grn/blk	30				
14	blk/brn		31		Free		
		brn/blk	32				
15	blk/gry		34		Free		
		gry/blk	35				
16	yel/blu		37		Free		
		blu/yel	38				

Table 3-129 TMDID (For U.S. Only) - Connector Panel Assignment with CHAMP Jack

CHAMP jack	TMDID			Notes
1	1a	1 Ring	Port 1	
26	1b	1 TIP		
2	2a	2 Ring	Port 2	
27	2b	2 TIP		
3	3a	3 Ring	Port 3	
28	3b	3 TIP		
4	4a	4 Ring	Port 4	
29	4b	4 TIP		
5	5a	5 Ring	Port 5	
30	5b	5 TIP		
6	6a	6 Ring	Port 6	
31	6b	6 TIP		
7	7a	Ring	Port 7	
32	7b	7 TIP		
8	8a	8 Ring	Port 8	
33	8b	8 TIP		
9			Free	
34				
10			Free	
35				
11			Free	
36				
12			Free	
37				
13			Free	
38				
14			Free	
39				
15			Free	
40				
16			Free	
41				

Table 3-130 TMDID (for U.S. only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	TMDID		MDFU-E	Patch panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

3.3.32 TMDID8 (for U.S. only)

Introduction

TMDID8 (**T**runk **M**odule **D**irect **I**nward **D**ialing) provides direct inward dialing from the central office (CO) to HiPath 3750 and HiPath 3700.

The board has eight trunk circuits that connect to analog trunks.

The circuits can be set up for immediate start or wink start.

Switches and LEDs

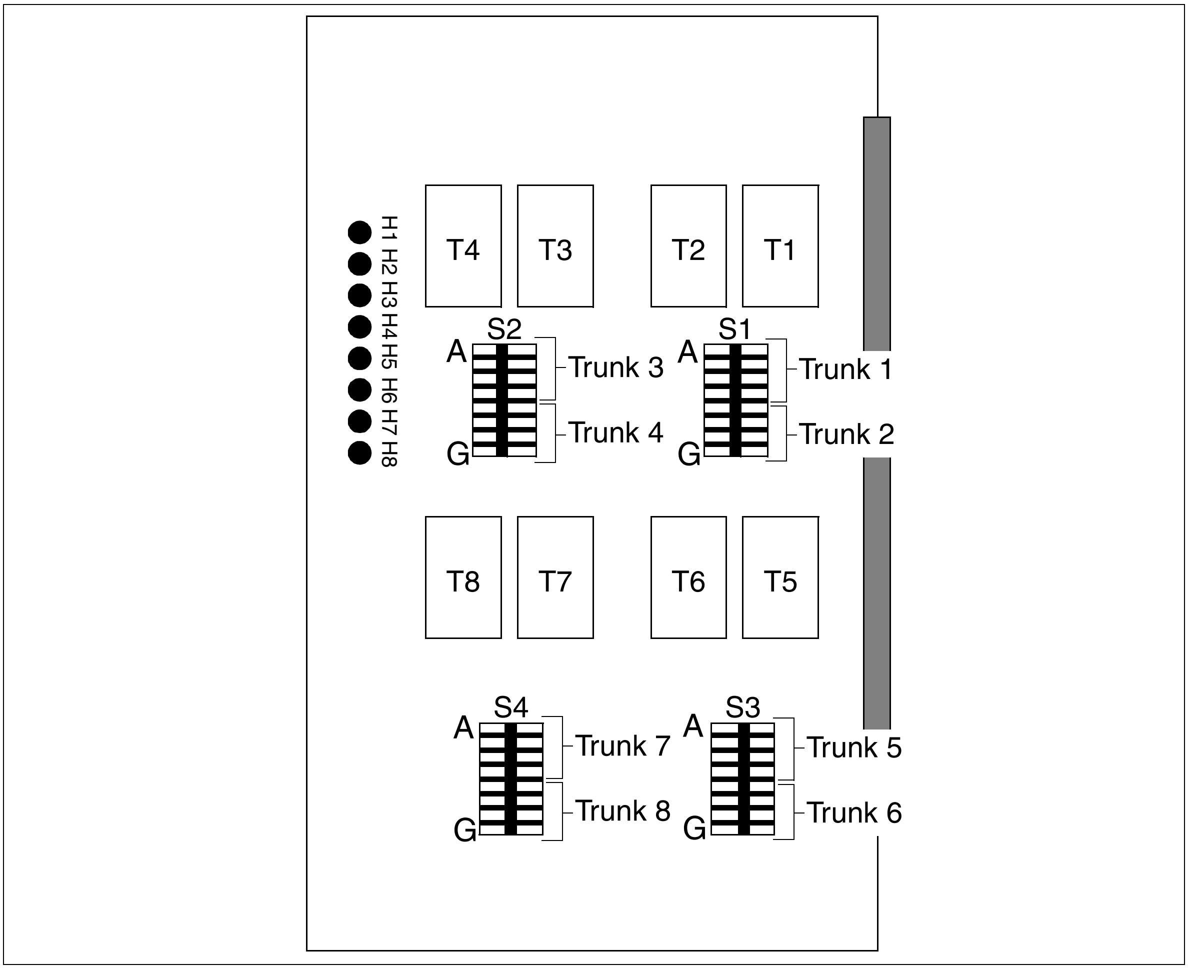

H1 H2 H3 H4 H5 H6 H7 H8
T4
T3
T2
T1
S2
A
G
Trunk 3
Trunk 4
S1
A
G
Trunk 1
Trunk 2
T8
T7
T6
T5
S4
A
G
Trunk 7
Trunk 8
S3
A
G
Trunk 5
Trunk 6

Figure 3-112 TMDID8 (for U.S. only) (S30810-Q2507-X)

Switches

Adjust switches S1 to S4 to compensate for trunk loop resistance.

Table 3-131 TMDID8 (for U.S. only) - Trunk Circuits and Recommended Switch Settings

Trunk circuit	**Loop < 1800 ohms: Open switch**	**Loop > 1800 ohms: Close switch**
1	S1A, S1B, S1C, S1D	S1A, S1B, S1C, S1D
2	S1E, S1F, S1G, S1H	S1E, S1F, S1G, S1H
3	S2A, S2B, S2C, S2D	S2A, S2B, S2C, S2D
4	S2E, S2F, S2G, S2H	S2E, S2F, S2G, S2H
5	S3A, S3B, S3C, S3D	S3A, S3B, S3C, S3D
6	S3E, S3F, S3G, S3H	S3E, S3F, S3G, S3H
7	S4A, S4B, S4C, S4D	S4A, S4B, S4C, S4D
8	S4E, S4F, S4G, S4H	S4E, S4F, S4G, S4H

LED statuses and their meanings

Table 3-132 TMDID8 (for U.S. only) - LED Statuses

Status of LEDs 1–8	**Meaning**
Off	Channel is idle, ready to use
On	Channel is seized
Flashing	Channel is deactivated
Winking	System software test in progress

Cable and connector assignment (backplane, MDF)

Table 3-133 TMDID8 (for U.S. only) - Assignment (SU Xx8)

#	**a-Wire (Tip)**	**b-Wire (Ring)**	**SU connector (backplane)**	**TMDID8**		**CHAMP jack, MDF**		**Notes**
			Xx8					
1	wht/blu		19	1a	Port 1	1	1 a/b-wire	
		blu/wht	39	1b		26	1 b/a-wire	
2	wht/ora		38	2a	Port 2	2	2 a/b-wire	
		ora/wht	48	2b		27	2 b/a-wire	
3	wht/grn		27	3a	Port 3	3	3 a/b-wire	
		grn/wht	47	3b		28	3 b/a-wire	
4	wht/brn		16	4a	Port 4	4	4 a/b-wire	
		brn/wht	46	4b		29	4 b/a-wire	
5	wht/gry		05	5a	Port 5	5	5 a/b-wire	
		gry/wht	45	5b		30	5 b/a-wire	
6	red/blu		14	6a	Port 6	6	6 a/b-wire	
		blu/red	44	6b		31	6 b/a-wire	
7	red/ora		23	7a	Port 7	7	7 a/b-wire	
		ora/red	43	7b		32	7 b/a-wire	
8	red/grn		32	8a	Port 8	8	8 a/b-wire	
		grn/red	42	8b		33	8 b/a-wire	
No other wires used.								

3.3.33 TMEW2

Introduction

The TMEW2 board (**T**runk **M**odule for **E**&M **W**orld) provides four analog tie trunk circuits for E&M signaling for HiPath 3800. Each tie trunk circuit has eight connectors: incoming speech path (2), outgoing speech path (2), incoming signaling (2) and outgoing signaling (2). This allows tie trunk traffic to other private communication systems.

> The peripheral board slots on the HiPath 3800 are fitted with SIPAC 9 SU connectors. Since the TMEW2 board has SIVAPAC connector strips, you will have to install a SIVAPAC-SIPAC board adapter in order to be able to use it in HiPath 3800.
> For information on upgrade procedures, please see Section 4.2.5.4.

Speech paths

The speech paths can be set to four-wire or two-wire mode. Four-wire connections should be used for high transmission quality on analog networks (this description deals only with four-wire mode).

The advantage of separate speech paths for the incoming and outgoing directions is that the stability (echo) of a connection is not adversely affected. In addition, repeaters in the transmission equipment compensate for attenuation loss on the line.

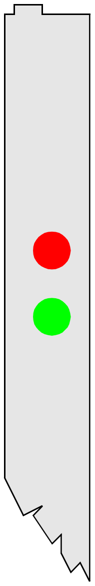
E&M signaling paths

The E&M signaling paths carry the signals that control connection setup and cleardown. Various interfaces can be selected, depending on the requirements of the remote system or transmission equipment. These interface types have different numbers of wires and different potentials.

Starting up a tie trunk

Before you can start up a tie trunk, you must determine the type of interface supported by the two systems. Type 2 is preferable because it virtually excludes problems with longitudinal voltages.

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-113 TMEW2 - Front Panel (S30810-Q2292-X100)

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.2.5.2.

LED statuses and their meanings

Table 3-134 TMEW2 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-135

Table 3-135 TMEW2 - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC connector	TMEW2		MDFU-E	Notes	
1	wht/blu		1	1ka	Port 1	1a	Ring	Transmit
		blu/wht	23	1kb		1b	Tip	
2	wht/ora		3	1ka	Port 2	2a	Ring	Transmit
		ora/wht	4	1kb		2b	Tip	
3	wht/grn		5	1ka	Port 3	3a	Ring	Transmit
		grn/wht	6	1kb		3b	Tip	
4	wht/brn		7	1ka	Port 4	4a	Ring	Transmit
		brn/wht	8	1kb		4b	Tip	
5	wht/gry		9	1ga	Port 1	5a	Ring	Receive
		gry/wht	10	1gb		5b	Tip	
6	red/blu		11	1ga	Port 2	6a	Ring	Receive
		blu/red	12	1gb		6b	Tip	
7	red/ora		13	1ga	Port 3	7a	Ring	Receive
		ora/red	14	1gb		7b	Tip	
8	red/grn		15	1ga	Port 4	8a	Ring	Receive
		grn/red	16	1gb		8b	Tip	
9	red/brn		17	1E	Port 1	9a	Ear	
		brn/red	18	1M		9b	Mouth	
10	red/gry		19	1E	Port 2	10a	Ear	
		gry/red	20	1M		10b	Mouth	
11	blk/blu		24	1E	Port 3	11a	Ear	
		blu/blk	25	1M		11b	Mouth	
12	blk/ora		26	1E	Port 4	12a	Ear	
		ora/blk	27	1M		12b	Mouth	
13	blk/grn		29		Port 1	13a	System ground, system battery	
		grn/blk	30			13b		
14	blk/brn		31		Port 2	14a	System ground, system battery	
		brn/blk	32			14b		
15	blk/gry		34		Port 3	15a	System ground, system battery	
		gry/blk	35			15b		
16	yel/blu		37		Port 4	16a	System ground, system battery	
		blu/yel	38			16b		

3.3.34 TMGL4 (for U.S. only)

Introduction

A TMGL4 trunk module connects up to four analog ground-start or loop-start trunks to HiPath 3550 and HiPath 3350.

Ground start is the default.

> ⚠ **Warning**
> You must disconnect the power and remove the slip-on connectors from the TMGL4 board before removing it from the system.
> Do not connect the slip-on connectors to the TMGL4 board until the board is seated in its slot and the system power is on.
> Failure to follow these instructions may severely damage the system.

Interfaces

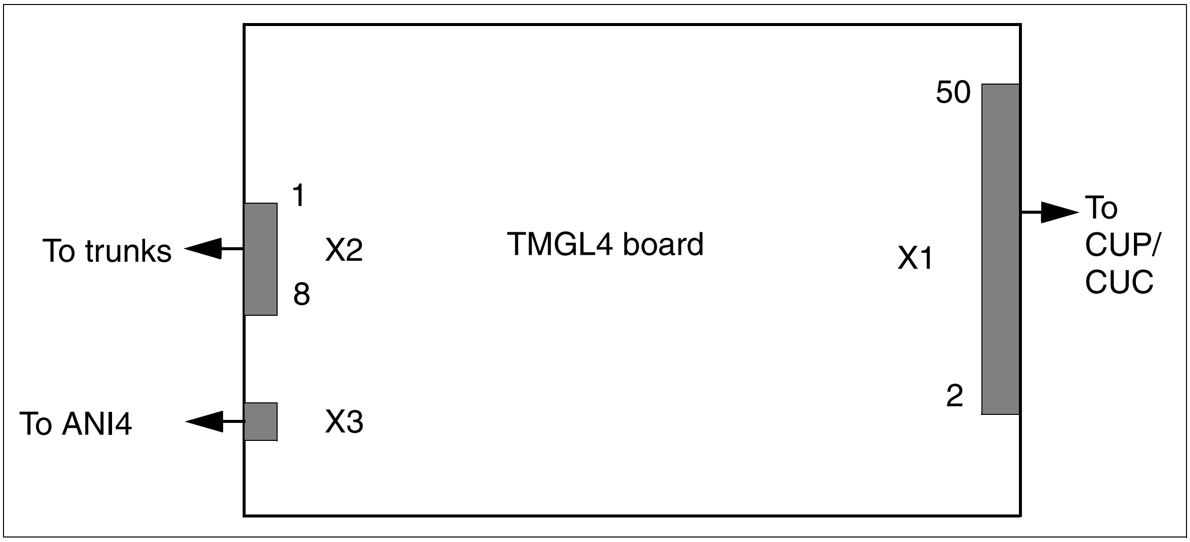


Figure 3-114 TMGL4 (For U.S. Only) - Interfaces (S30810-Q2918-X)

Contact assignment

Table 3-136 TMGL4 (For U.S. Only) - Contact Assignment

Contact	Connector X2	Port
1	b-wire (ring), trunk 1	1
2	a-wire (tip), trunk 1	
3	b-wire (ring), trunk 2	2
4	a-wire (tip), trunk 2	
5	b-wire (ring), trunk 3	3
6	a-wire (tip), trunk 3	
7	b-wire (ring), trunk 4	4
8	a-wire (tip), trunk 4	

Note: Pinouts shown are at the board itself. The main distribution frame cable (MDF cable) supplied reverses the signal order before the MDF.

3.3.35 TMGL4R (for U.S. only)

Introduction

A TMGL4R trunk module connects up to four analog ground-start or loop-start trunks to HiPath 3500 and HiPath 3300.

Ground start is the default.

Interfaces

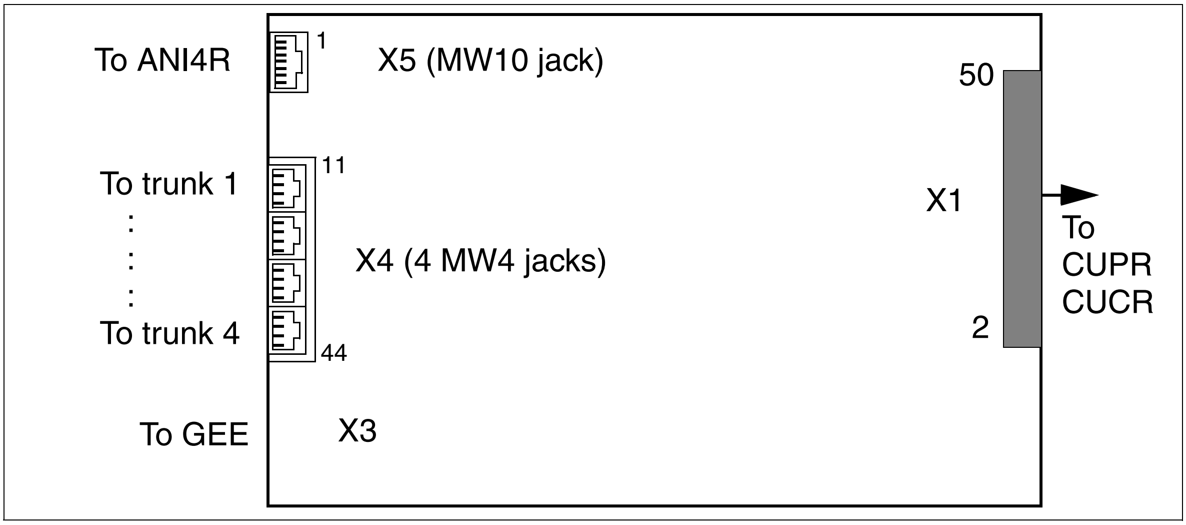

To ANI4R
1
X5 (MW10 jack)
50
To trunk 1
11
X1
:
:
:
X4 (4 MW4 jacks)
To CUPR CUCR
To trunk 4
44
2
To GEE
X3

Figure 3-115 TMGL4R (for U.S. only) (S30810-K2918-Z)

If ANI4R is installed as option 1 or 2, TMGL4R board must be inserted in slot 4, 6 or 8 (slots 6 and 8 are not available with HiPath 3300).

Contact assignment

Table 3-137 TMGL4R (for U.S. only) - Contact Assignment

Port	X3 Pin (To GEE)	X4 Pin (To trunks 1-4)	X5 Pin (To ANI4R)	Signal
1	3	12	3	b-wire (ring), trunk 1
	2	13	2	a-wire (tip), trunk 1
2	5	22	5	b-wire (ring), trunk 2
	4	23	4	a-wire (tip), trunk 2
3	7	32	7	b-wire (ring), trunk 3
	6	33	6	a-wire (tip), trunk 3
4	9	42	9	b-wire (ring), trunk 4
	8	43	8	a-wire (tip), trunk 4
–	10	–	10	Call charging module assignment (GMZ)

3.3.36 TMGL8 (for U.S. only)

Introduction

The TMGL8 trunk module connects up to eight analog ground-start or loop-start trunks to HiPath 3750 and HiPath 3700.

Ground start is the default.

Switches and LEDs

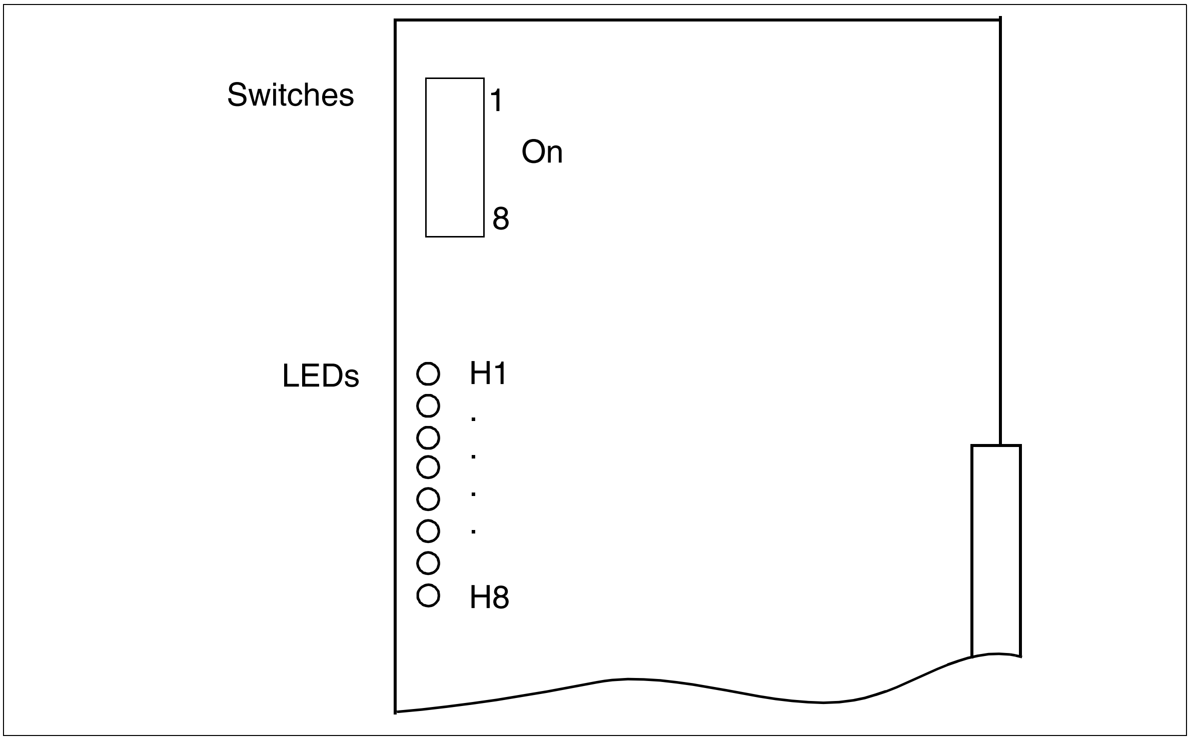


Figure 3-116 TMGL8 (for U.S. only) (S30810-K2703-Z)

Switches

The TMGL8 board has an eight-path microswitch under a flip-up cover. The following settings apply for each channel:

- ON (right): Channel is enabled.
- OFF (left): Channel is disabled; no new seizures are permitted.

LED statuses and their meanings

Table 3-138 TMGL8 (for U.S. only) - LED Statuses

Status of LEDs 1–8	Meaning
Off	Channel is idle, ready to use
On	Channel is seized
Flashing	Channel is deactivated
Winking	System software test in progress

Cable and connector assignment (backplane, MDF)

Table 3-139 TMGL8 (for U.S. only) - Assignment (SU Xx8)

#	a-Wire (Tip)	b-Wire (Ring)	SU connector (backplane)	TMGL8		CHAMP jack, MDF		Notes
			Xx8					
1	wht/blu		19	1a	Port 1	1	1 a/b-wire	
		blu/wht	39	1b		26	1 b/a-wire	
2	wht/ora		38	2a	Port 2	2	2 a/b-wire	
		ora/wht	48	2b		27	2 b/a-wire	
3	wht/grn		27	3a	Port 3	3	3 a/b-wire	
		grn/wht	47	3b		28	3 b/a-wire	
4	wht/brn		16	4a	Port 4	4	4 a/b-wire	
		brn/wht	46	4b		29	4 b/a-wire	
5	wht/gry		05	5a	Port 5	5	5 a/b-wire	
		gry/wht	45	5b		30	5 b/a-wire	
6	red/blu		14	6a	Port 6	6	6 a/b-wire	
		blu/red	44	6b		31	6 b/a-wire	
7	red/ora		23	7a	Port 7	7	7 a/b-wire	
		ora/red	43	7b		32	7 b/a-wire	
8	red/grn		32	8a	Port 8	8	8 a/b-wire	
		grn/red	42	8b		33	8 b/a-wire	
No other wires used.								

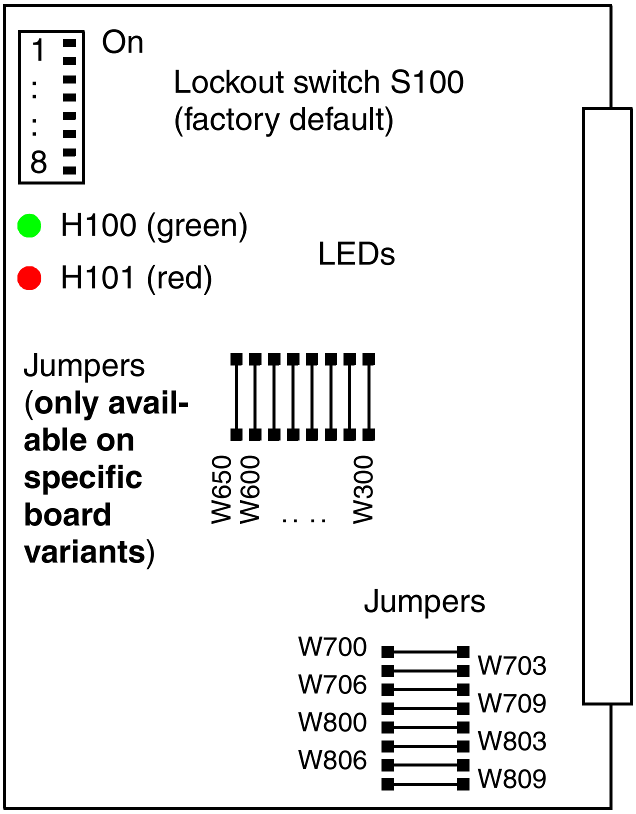
3.3.37 TML8W (Not for U.S.)

Introduction

A TML8W (**T**runk **M**odule **L**oop Start **W**orld) board connects up to eight analog trunks for HiPath 3750 and HiPath 3700 using the loop-start protocol.

The jumpers on the TML8W must be adjusted for call detail recording with a GEE8 subboard.

Jumpers on TML8W


1
:
:
8
On
Lockout switch S100
(factory default)
● H100 (green)
● H101 (red)
LEDs
Jumpers
(**only available on specific board variants**)
W650
W600
. . . .
W300
Jumpers
W700
W706
W800
W806
W703
W709
W803
W809

Jumpers (Circuit)	Inserted	Call Detail Recording (GEE8)
W700 (1) W703 (2) W706 (3) W709 (4)	Yes	16 kHz/50 Hz
W800 (5) W803 (6) W806 (7) W809 (8)	No	12 kHz
W650 (8) W600 (7) W550 (6) W500 (5)	Yes	Without silent reversal
W450 (4) W400 (3) W350 (2) W300 (1)	No	with silent reversal

Factory default = All jumpers inserted

Figure 3-117 TML8W (Not for U.S.) (S30817-Q626-Axxx, -Bxxx)

For Austria only: If a ÜFS trunk is connected to the TML8W, remove the jumpers (W300 to W650) to activate silent reversal.
If silent reversal is inactive, users in the HiPath 3750 and HiPath 3700 would hear a busy signal following backward release instead of being released.

LED statuses and their meanings

Table 3-140 TML8W (Not for U.S.) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one circuit is activated.	

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-141 TML8W (Not for U.S.) - Cable Assignment

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	TML8W		MDFU/ MDFU-E	Patch panel, MW8 pin	Notes
				BP: Xx8					
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

3.3.38 TMQ4 (for U.S. only)

Introduction

An TMQ4 (ISDN BRI) trunk module connects up to four digital trunks to the HiPath 3550 and HiPath 3350.

The TMQ4 board provides basic rate interface (BRI) ISDN via a U2B$_1$Q interface. The interface supports the following central office protocols:

- AT&T 5Ess NI-1
- AT&T 5ESS Custom
- Nortel DMS100 NI-1
- Siemens EWSD NI-1

Interfaces

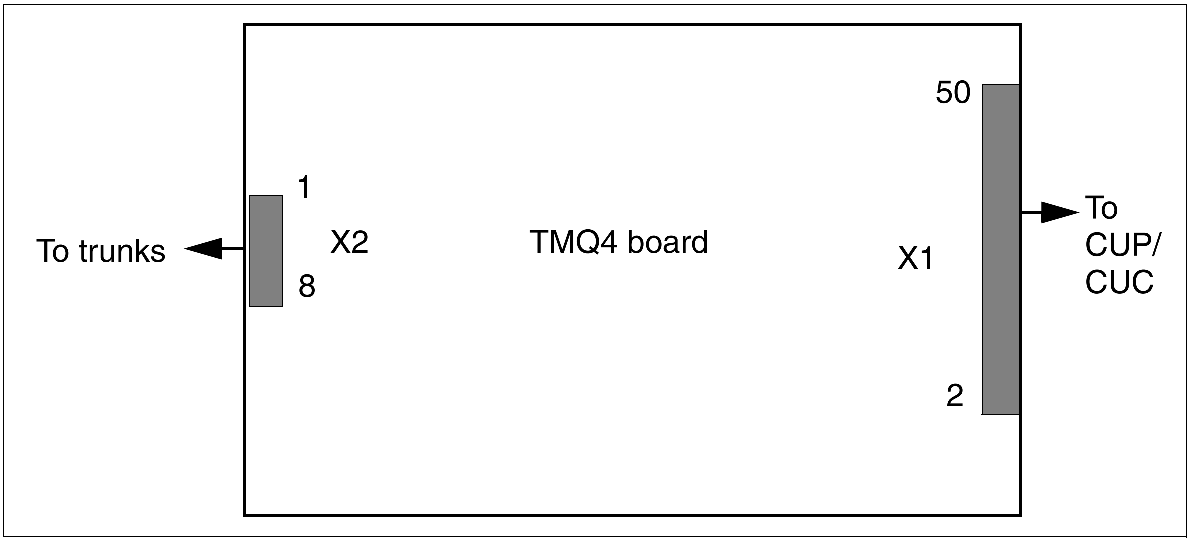


Figure 3-118 TMQ4 (for U.S. only) (S30810-Q2917-X)

Contact assignment

Table 3-142 TMQ4 (for U.S. only) - Contact Assignment

Contact	Connector X2	Port		Contact	Connector X2	Port
1	b-wire (ring), trunk 1	1		5	b-wire (ring), trunk 3	3
2	a-wire (tip), trunk 1			6	a-wire (tip), trunk 3	
3	b-wire (ring), trunk 2	2		7	b-wire (ring), trunk 4	4
4	a-wire (tip), trunk 2			8	a-wire (tip), trunk 4	

Note: Pinouts shown are at the board itself. The main distribution frame cable (MDF cable) supplied reverses the signal order before the MDF.

3.3.39 TMST1 (for U.S. only)

Introduction

The TMST1 trunk board connects a digital trunk with HiPath 3750 and HiPath 3700. This is how an ISDN primary multiplex connection is implemented (PRI, Primary Rate Interface) by means of a T1 interface.

It can also be used for the following layer-1 operating modes:

- Super Frame SF
- Extended Super Frame ESF

A maximum of eight TMST1 modules can be used in a HiPath 3750 or HiPath 3700.

Rather than connecting to a main distribution frame (MDF), the TMST1 board connects to a channel service unit (CSU). The CSU supplies the required secondary protection.

Switches and LEDs

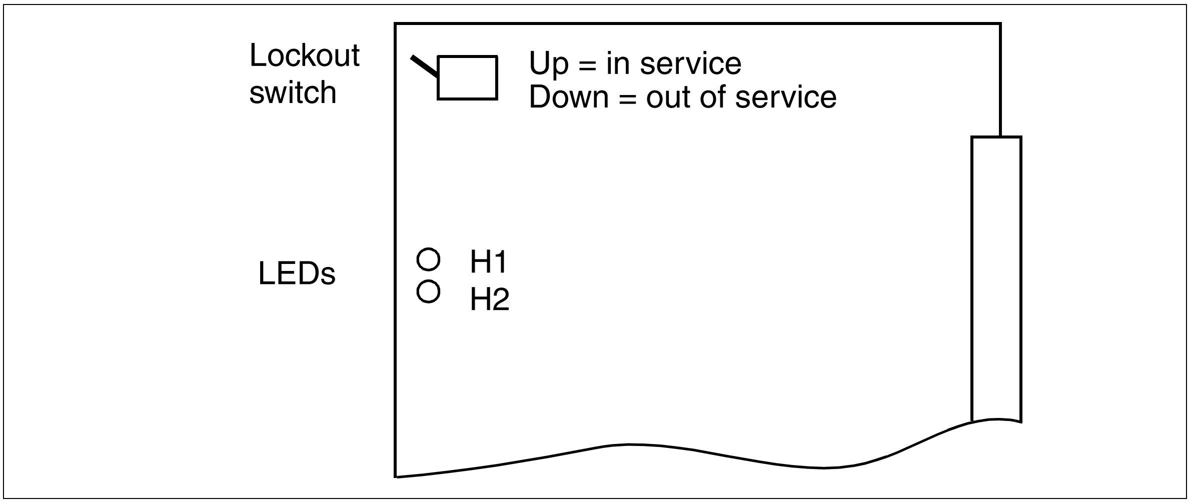


Figure 3-119 TMST1 (for U.S. only) (S30810-Q2920-X)

The lockout switch alerts the system software that the module will be removed so that no new calls are routed to the board.

LED statuses and their meanings

Table 3-143 TMST1 (for U.S. only) - LED Statuses

Red LED	Green LED	Status	Activity
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	
On	On	Board error	Replace board.

TMST1 adapter (SIPAC 1 SU - MW8 (RJ48C)), contact assignment

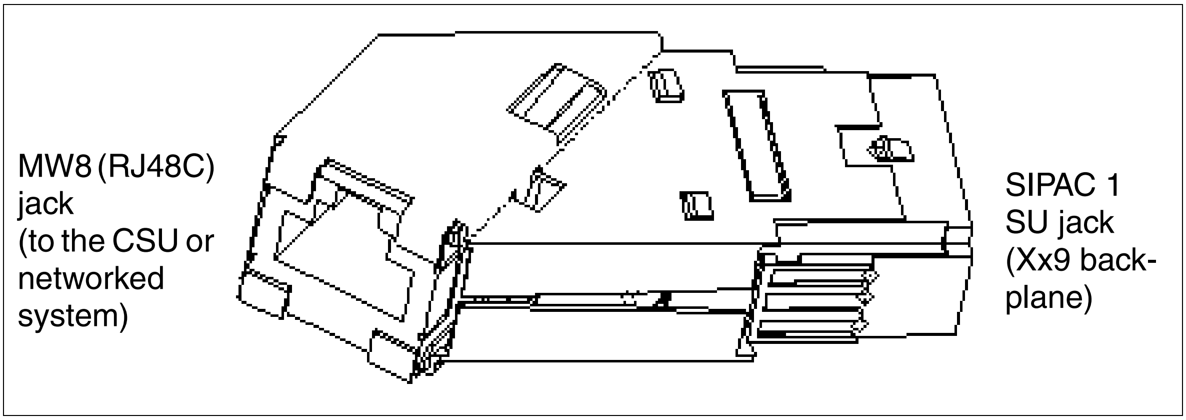

MW8 (RJ48C) jack (to the CSU or networked system)
SIPAC 1 SU jack (Xx9 backplane)

Figure 3-120 TMST1 Adapter (SIPAC 1 SU - MW8 (RJ48C)) C39228-A7195-A12 (for U.S. only)

Table 3-144 TMST1 Adapter (For U.S. Only) - Cable Assignment

MW8 (RJ48C)	SIPAC 1 SU jack	SU connector backplane	TMST1
		Xx9	
1	C2	22	b-wire (ring), receive
2	E2	2	a-wire (tip), receive
3	–	–	–
4	C6	26	b-wire (ring), transmit
5	E6	6	a-wire (tip), transmit
6	–	–	–
7	–	–	–
8	–	–	–

3.3.40 TMS2 (Not for U.S.)

Introduction

The TMS2 (**T**runk **M**odule **S_{2M}**) board provides 30 B channels (voice channels) for HiPath 3750 and HiPath 3700, which are used

- for the S2M trunk connection (via NT).
- for the S2M networking via S_{2M} lines.

To support country-specific CAS protocols, you can use the Euro-ISDN CAS gateway ECG. The ECG cabinet is a protocol converter that converts the Euro-ISDN protocol into the Channel Associated Signaling CAS protocol. Refer to the installation instructions, which are provided with each ECG cabinet, for information on the connection and power supply.
For HiPath 3000 V1.0 and later, you can also use the new TMCAS board to support country-specific CAS protocols.

Switches and LEDs

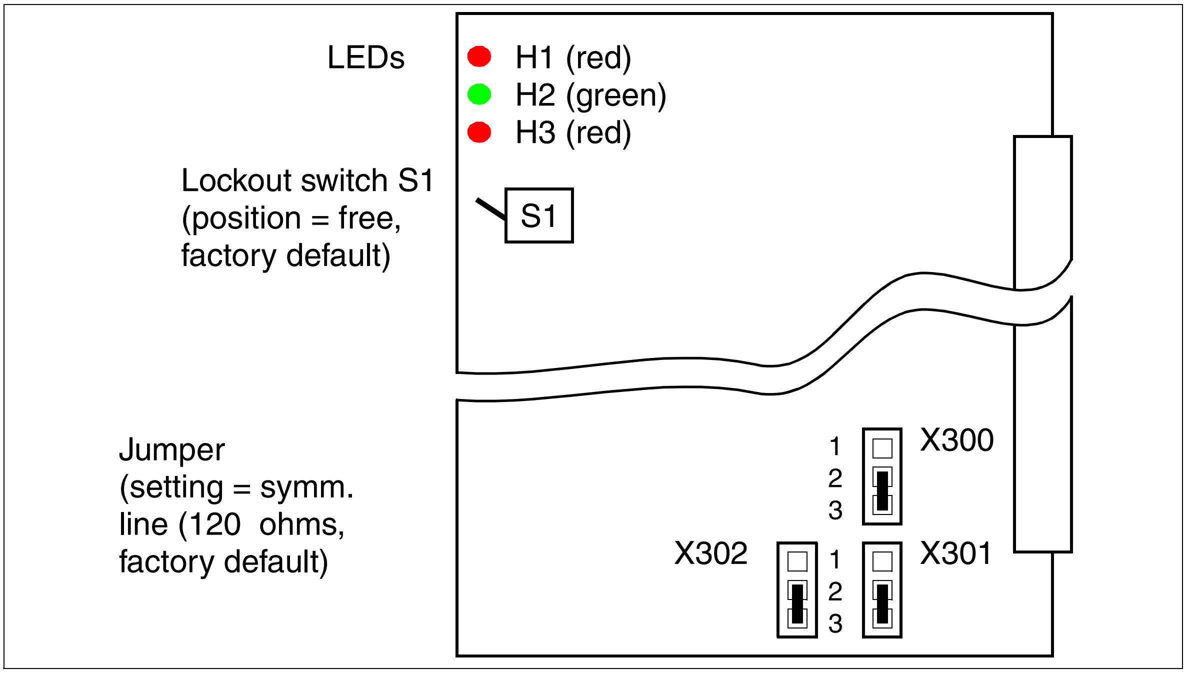

LEDs
H1 (red)
H2 (green)
H3 (red)
Lockout switch S1
(position = free,
factory default)
S1
Jumper
(setting = symm.
line (120 ohms,
factory default)
1
2
3
X300
X302
1
2
3
X301

Figure 3-121 TMS2 (Not for U.S) (S30810-Q2915-X)

Jumper settings

The X300 or X302 jumpers are used to set the TMS2 interface for the connection of this interface to NT1. The following can be set:

- symmetric line (120 ohms)
  Use only pre-formed cables S30267-Z57-Axxx to guarantee problem-free operation (length = 6 m (not available in Germany), 10 m or 20 m).
- coaxial line (75 ohms)
  S30267-Z69-Axxx.

TMS2 Interface	Jumper X300	Jumper X301	Jumper X302
120 ohms = factory default	2 - 3	2 - 3	2 - 3
75 ohms	1 - 2	1 - 2	1 - 2

SU connector assignment (backplane) and cable color codes

Table 3-145 TMS2 (Not for U.S.) - SU Connector Assignment and Cable Color Codes

SU connector Xx8/Xx9[1] Pin	Function	Cable S30267-Z57-Axxx, color code	
		Up to and including status 6	Status 7 or later
2	a-wire (T), receive	grn	wht/blu
22	b-wire (R), receive	blk	blu/wht
6	a-wire (T), transmit	red	wht/ora
26	b-wire (R), transmit	blk	ora/wht

[1] SU connector Xx8B is used in board status 4 and lower, whereas SU connector Xx9 is used in board status 5 and higher.

Note that the SU connector Xx9 was used in the old TMS2M board.

LED statuses and their meanings

- H1 (red) and H2 (green) LEDs

Table 3-146 TMS2 (Not for U.S.) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000 Manager E.	Check whether the board was deactivated using HiPath 3000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

- H3 LED (see Figure 3-121): Reference clock display (clock is generated if this feature was configured using HiPath 3000 Manager E).
  - On: Reference clock for clock generator is created.
  - Off: No reference clock

S_{2M} trunk connection

Table 2-10 lists examples of the maximum cable lengths for connecting trunks.

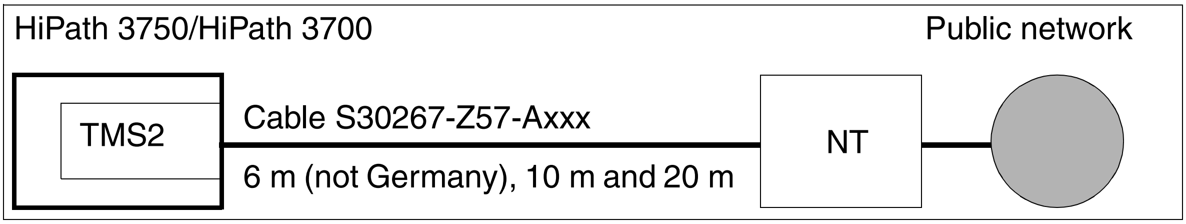


Figure 3-122 S_{2M} trunk connection

Observe the following when connecting NTs using the S30267-Z57-Axxx cable:

- Keep the cable from the NT to HiPath 3750 or HiPath 3700 as short as possible to ensure proper operation.
- HiPath 3750 and HiPath 3700 must always be grounded (whether the line used by the network provider is copper or optical fiber) (see 1 TR 211 item 2.4, Protective Measures and Grounding). The diameter of the earth conductor must be at least 2.5 mm^2. Grounding the system using sheath wires is not sufficient.
  For operating reasons, keep the ground connection from the NT to the system as short as possible.

> ⚠ **Caution**
> In order to guarantee successful operation, you must ensure that the NT is grounded on the network provider side.

- Power supply
  The NT must be fed over the –48 V (**max. 10 W**, observe the power requirements of the NTs) of the UPSM (see Figure 3-123).
  The voltage is fed out on backplane connector X06 (pins 17 + 37 = –48 V). Use the CABLU supplied to connect the system with the MDFU. This places the voltage on pair no. 15 (= –48 V) of the splitting strip.
  The delivery does not include a CABLU if the REAL board has been ordered or is already being used (the necessary CABLU is included in the delivery of the “ALUM using REAL” feature).

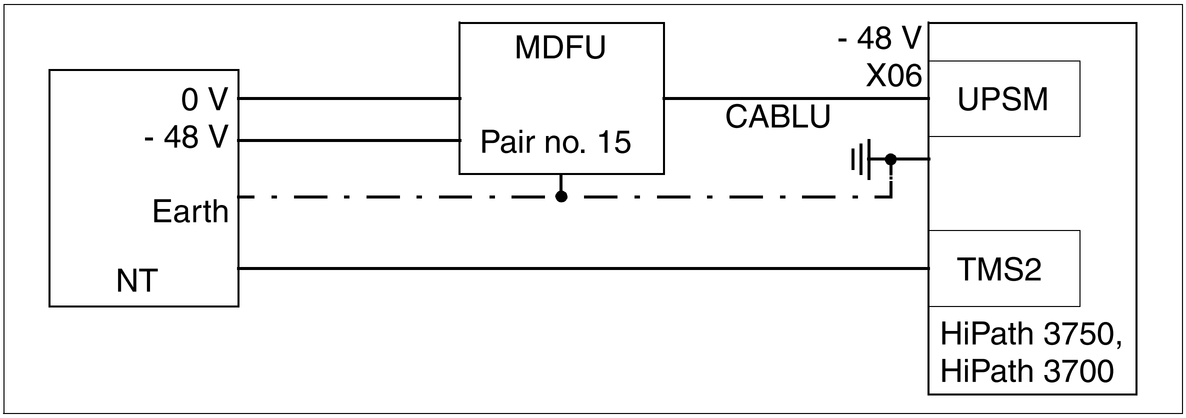
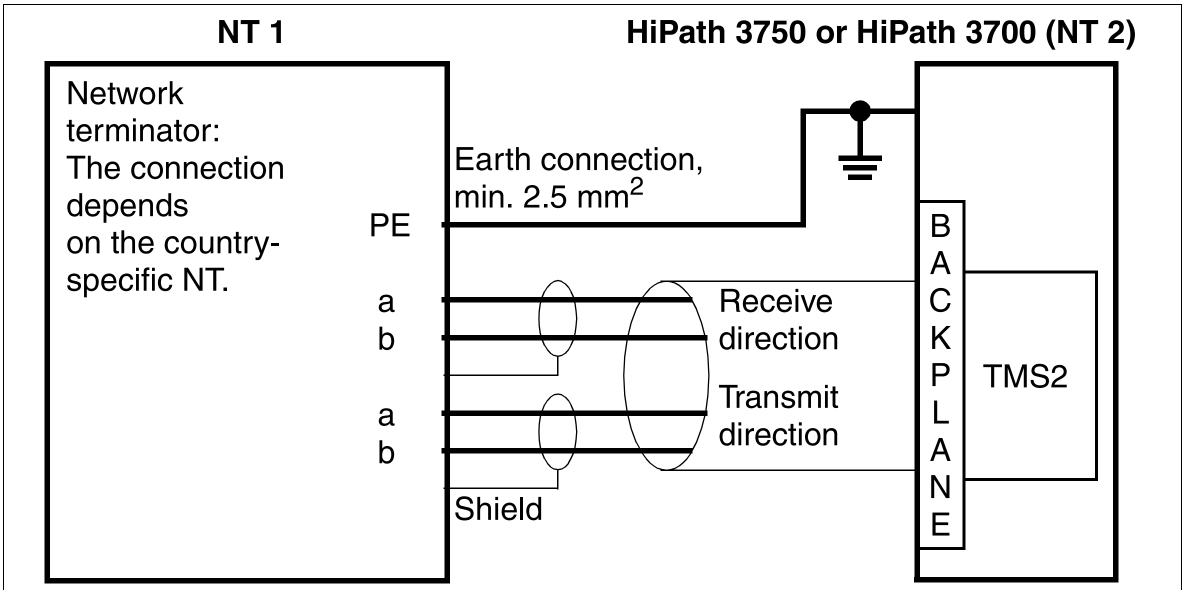

MDFU
- 48 V
X06
UPSM
0 V
- 48 V
CABLU
Pair no. 15
Earth
NT
TMS2
HiPath 3750,
HiPath 3700

Figure 3-123 Supplying NTs via S_{2M}

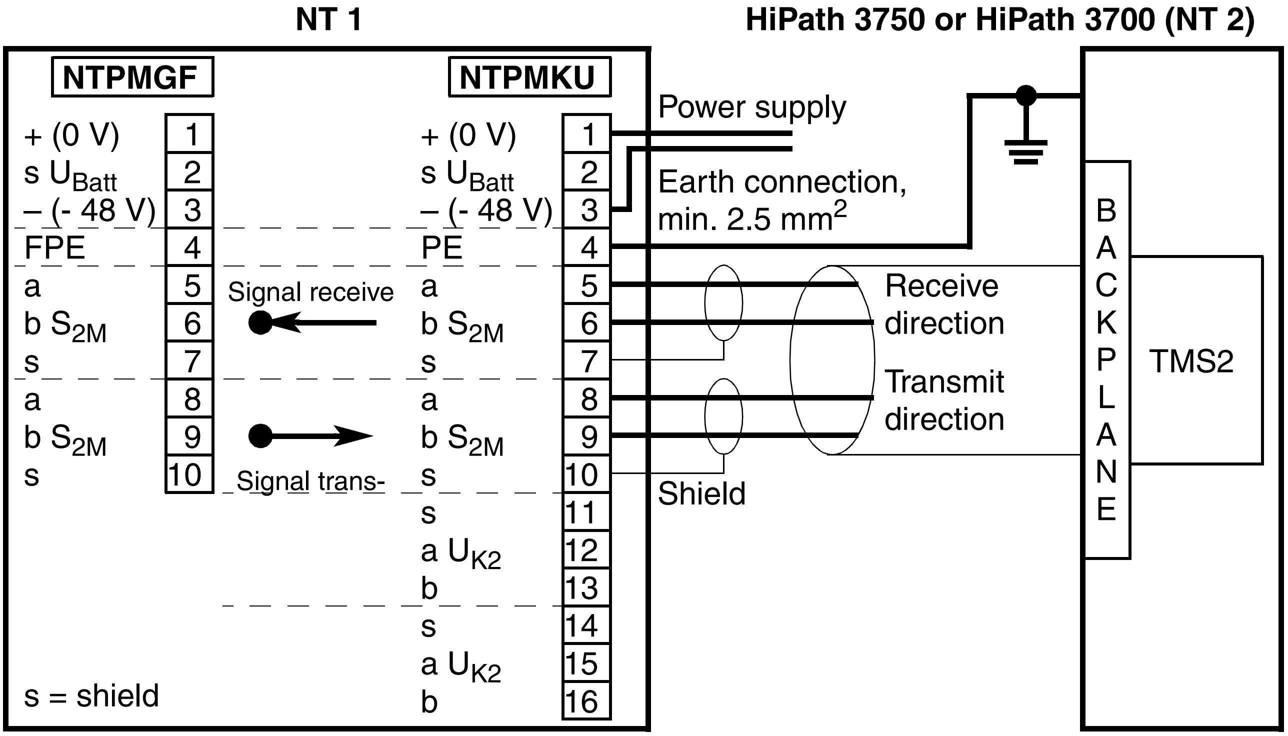
S_{2M} - NT Connection


NT 1
HiPath 3750 or HiPath 3700 (NT 2)
Network terminator: The connection depends on the country-specific NT.
Earth connection, min. 2.5 mm^2
PE
a
b
a
b
Shield
Receive direction
Transmit direction
BACKPLANE
TMS2

- Power supply, see Figure 3-123
- Backplane, connection to
  – Xx8
  – XX9 (board release 5 or later)
- Cable S30267-Z57-Axxx
  – Length: 6 (not in Germany), 10 and 20 m
  – Color code (see Table 3-145)
  The wires in a wire pair may be interchanged.

Figure 3-124 S_{2M} - NT Connection (Not for U.S.)

S_{2M} connection to Deutsche Telekom NT (for Germany only)


NT 1
HiPath 3750 or HiPath 3700 (NT 2)
NTPMGF
+ (0 V) 1
s UBatt 2
– (- 48 V) 3
FPE 4
a 5
b S2M 6
s 7
a 8
b S2M 9
s 10
s = shield
Signal receive
Signal trans-
NTPMKU
+ (0 V) 1
s UBatt 2
– (- 48 V) 3
PE 4
a 5
b S2M 6
s 7
a 8
b S2M 9
s 10
s 11
a UK2 12
b 13
s 14
a UK2 15
b 16
Power supply
Earth connection, min. 2.5 mm2
Receive direction
Transmit direction
Shield
BACKPLANE
TMS2

- Power supply, see Figure 3-123
- Backplane, connection to
  – Xx8
  – Xx9 (board release 5 or later)
- Cable S30267-Z57-Axxx
  – Length: 6 (not in Germany), 10 and 20 m
  – Color code (see Table 3-145)
  The wires in a wire pair may be interchanged.

Figure 3-125 S_{2M} Connection to Deutsche Telekom NT (For Germany Only)

S_{2M} networking

For examples of the maximum cable lengths for direct CorNet N/CorNet NQ networking, please refer to Table 2-10.

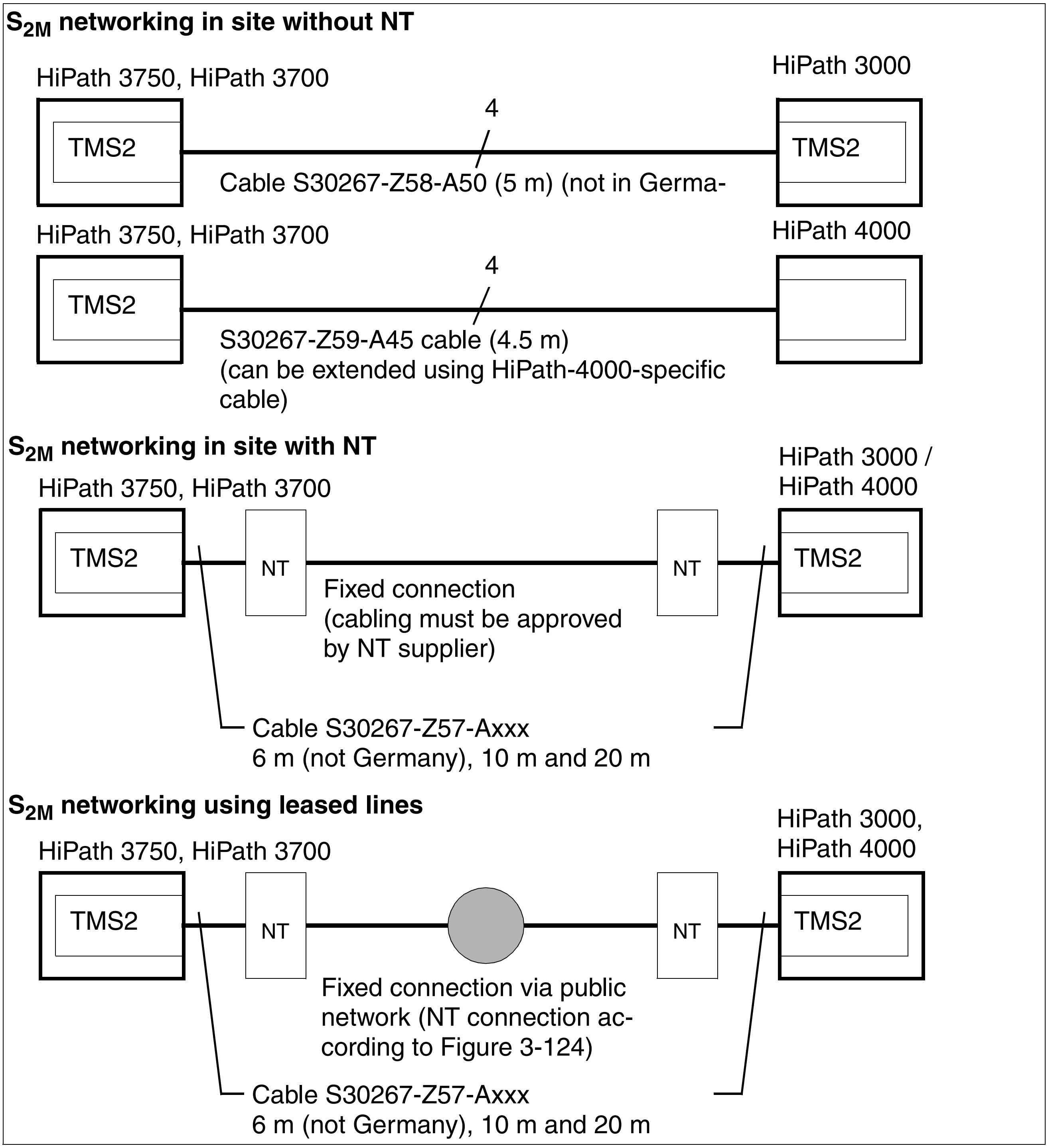

S2M networking in site without NT
HiPath 3750, HiPath 3700
HiPath 3000
TMS2
4
TMS2
Cable S30267-Z58-A50 (5 m) (not in Germa-
HiPath 3750, HiPath 3700
HiPath 4000
TMS2
4
S30267-Z59-A45 cable (4.5 m)
(can be extended using HiPath-4000-specific cable)
S2M networking in site with NT
HiPath 3750, HiPath 3700
HiPath 3000 / HiPath 4000
TMS2
NT
NT
TMS2
Fixed connection
(cabling must be approved by NT supplier)
Cable S30267-Z57-Axxx
6 m (not Germany), 10 m and 20 m
S2M networking using leased lines
HiPath 3750, HiPath 3700
HiPath 3000, HiPath 4000
TMS2
NT
NT
TMS2
Fixed connection via public network (NT connection according to Figure 3-124)
Cable S30267-Z57-Axxx
6 m (not Germany), 10 m and 20 m

Figure 3-126 S_{2M} Networking Options (Not for U.S.)

3.3.41 TST1 (for U.S. only)

Introduction

The digital T1/PRI trunk module (TST1) connects the communications server to primary rate interface (PRI) ISDN via a T1 interface.

There are two versions of this board:

- S30810-Q2919-X - for use in the HiPath 3550 (wall housing)
- S30810-K2919-Z - for use in the HiPath 3500 (19-inch housing)

The board can also be used for the following layer-1 operating modes:

- Super Frame SF
- Extended Super Frame ESF

Board usage is subject to the following restrictions:

- Only one TST1 board allowed (primary multiplex access)
- For slot 7 or 9 only

Rather than connecting to a main distribution frame (MDF), the TST1 connects to a channel service unit (CSU). The CSU supplies the required secondary protection.

Interfaces

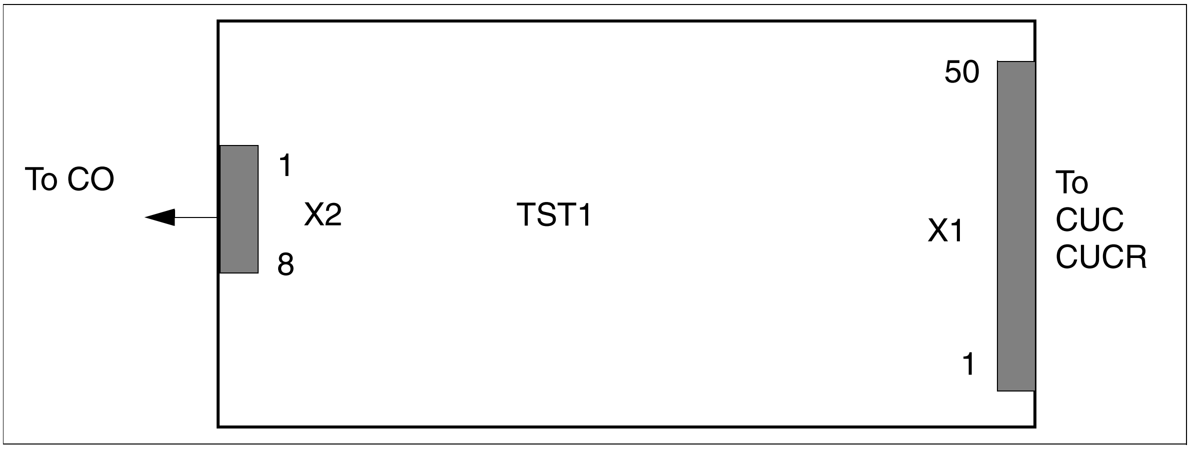


Figure 3-127 TST1 (For U.S. Only) (S30810-Q2919-X/S30810-K2919-Z)

Contact assignment

Table 3-147 TST1 (For U.S. Only) - Contact Assignment

Contact	X2		Contact	X2
1	b-wire (ring), receive		5	a-wire (tip), transmit
2	a-wire (tip), receive		6	not connected
3	not connected		7	not connected
4	b-wire (ring), transmit		8	not connected

3.3.42 TS2 (Not for U.S.), TS2R (Not for U.S.)

Introduction

The board contains a four-wire interface with S_{2M} code for connection to the public telecommunications network or private networks.

Up to thirty trunk calls can be conducted simultaneously via the S_{2M} interface. The total transmission speed including signaling and synchronization is 2048 Mbps.

Two trace files are available:

- Implemented up to and including V4.0:
  - TS2 (**T**runk Module **S2**M) S30810-Q2913-X100 (Figure 3-128) - for use in HiPath 3550 (wall housing)
  - TS2R (**T**runk Module **S2**M **R**ack) S30810-K2913-Z100 (Figure 3-129) - for use in HiPath 3500 (19-inch housing)
- Implemented in V5.0 and later:

  > In HiPath 3000/5000 V5.0 and later, the B channels in the TS2 and TS2R boards are subject to license. Consequently, the two boards below have been assigned a new hardware identification code. The new codes prevent the boards from being used in earlier versions. Functionality and layout of the boards have not been changed.

  - TS2 (**T**runk Module **S2**M) S30810-Q2913-X300 (Figure 3-128) - for use in HiPath 3550 (wall housing)
  - TS2R (**T**runk Module **S2**M **R**ack) S30810-K2913-Z300 (Figure 3-129) - for use in HiPath 3500 (19-inch housing)

Board usage is subject to the following restrictions:

- Only one TS2/TS2R board allowed (primary multiplex access)
- For slot 7 or 9 only

To support country-specific CAS protocols, you can use the Euro-ISDN CAS gateway ECG. The ECG cabinet is a protocol converter that converts the Euro-ISDN protocol into the Channel Associated Signaling CAS protocol. Refer to the installation instructions, which are provided with each ECG cabinet, for information on the connection and power supply.
For HiPath 3000 V1.0 and later, you can also use the new TMCAS board to support country-specific CAS protocols.

TS2 interfaces

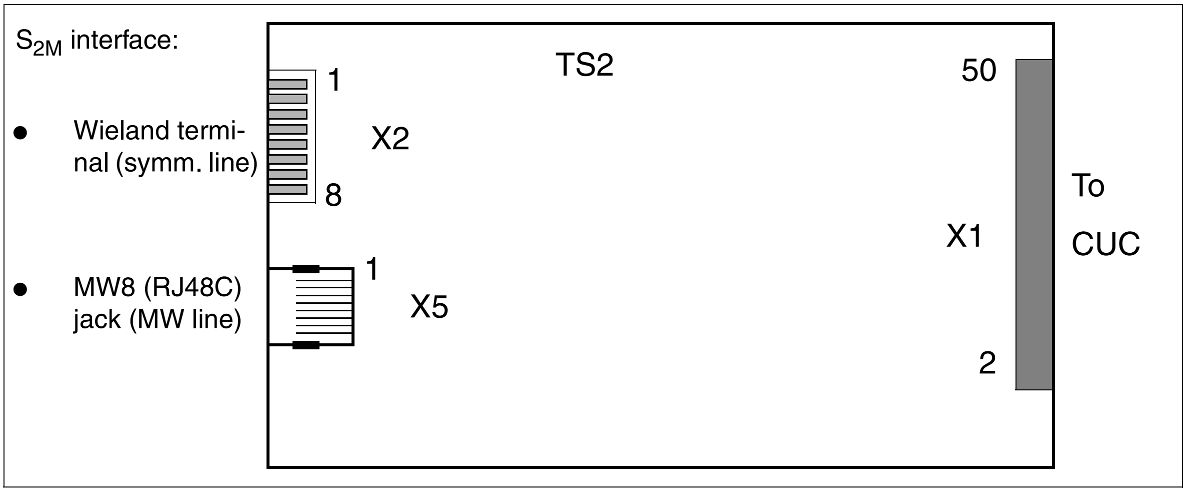

S2M interface:
Wieland terminal (symm. line)
MW8 (RJ48C) jack (MW line)
TS2
1
8
X2
1
X5
50
X1
2
To CUC

Figure 3-128 TS2 (Not for U.S.) - Interfaces (S30810-Q2913-X100, -X300)

TS2R interfaces

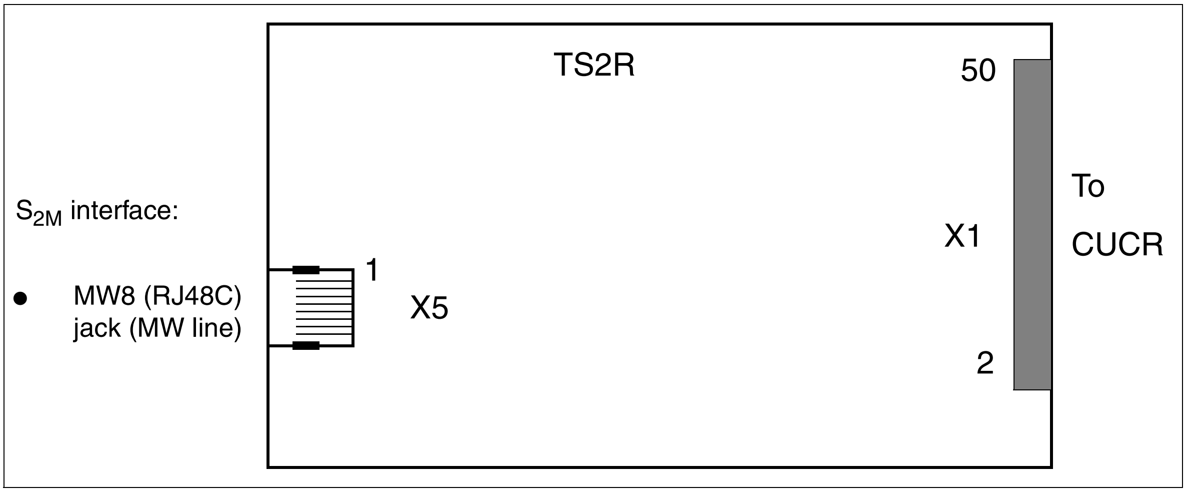

TS2R
S2M interface:
MW8 (RJ48C) jack (MW line)
1
X5
50
X1
2
To CUCR

Figure 3-129 TS2R (Not for U.S.) - Interfaces (S30810-K2913-Z100, -Z300)

Network interfaces

The TS2 board is connected to the network transfer point (NT1) via the symmetrical line (120 ohms, four-wire twisted-pair cable) at X2 or via an MW line at X5.

Note: use the connection kits listed on Page 3-311 for NT connections in Spain and Portugal.

- Symmetrical line (120 ohms)
  The maximum cable length (approx. 130 m) depends on the quality of the cable used and its signal attenuation. Use shielded cables only to guarantee proper operation.

  Connect the cable to the X2 using an 8-pin Wieland terminal (TS2 only).

  Table 3-148 Contact Assignments for X2 Connector

Contact	X2 (TS2 only)
1	–48 V (NT1 feeding), max. 15 W
2	0 V (NT1 feeding)
3	GND
4	Board ID for TMCAS
5	a-wire (T), transmit
6	b-wire (R), transmit
7	a-wire (T), receive
8	b-wire (R), receive

- MW line (MW8 jack (RJ48C))
  The shielded 8-pin MW8 (RJ48C) jack X5 is provided for connecting MW lines. The maximum cable length (approx. 100 m) depends on the quality of the cable used and its signal attenuation.

  Table 3-149 Contact Assignments for the MW8 (RJ48C) jack X5

Pin	X5	Pin	X5
1	b-wire (R), receive	6	Free
2	a-wire (T), receive	7	Free
3	Free	8	Free
4	b-wire (R), transmit	11	GND
5	a-wire (T), transmit	12	GND
An additional line must be provided from pins 1 and 2 on the X2 connector to NT1 for NT1 feeding.			

S_{2M} trunk connection

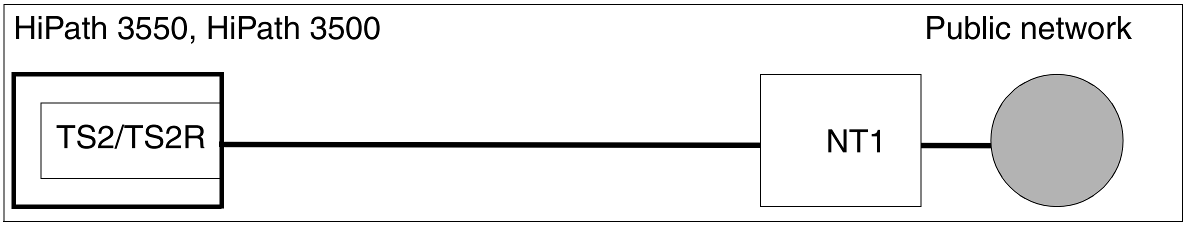


Figure 3-130 S_{2M} Trunk Connection

Keep the cable from the NT to HiPath 3550 or HiPath 3500 as short as possible to ensure proper operation.

> ⚠ **Caution**
> There should be absolutely **no** ground connection between the HiPath 3550 wall housing and the NT. Do not connect the shield of the connection cable you are using either on the HiPath 3550 side or on the NT side.
> If the HiPath 3550 system is separately grounded (such as with the 19-inch housing of the HiPath 3500), you may make a connection between HiPath 3550 and NT.

NT1 power supply

- TS2 board
  The NT1 supply voltage of –48 V can be tapped from the X2 connector (see Table 3-148). There is a power limit of < 15 W for this voltage, which the system feeds over the CUC.
- TS2R board
  The NT1 power supply must come from an S30122-X7321-X (S30122-X7321-X100 with UPS operation) power supply unit.

Cable set for NT connections (Spain and Portugal only)

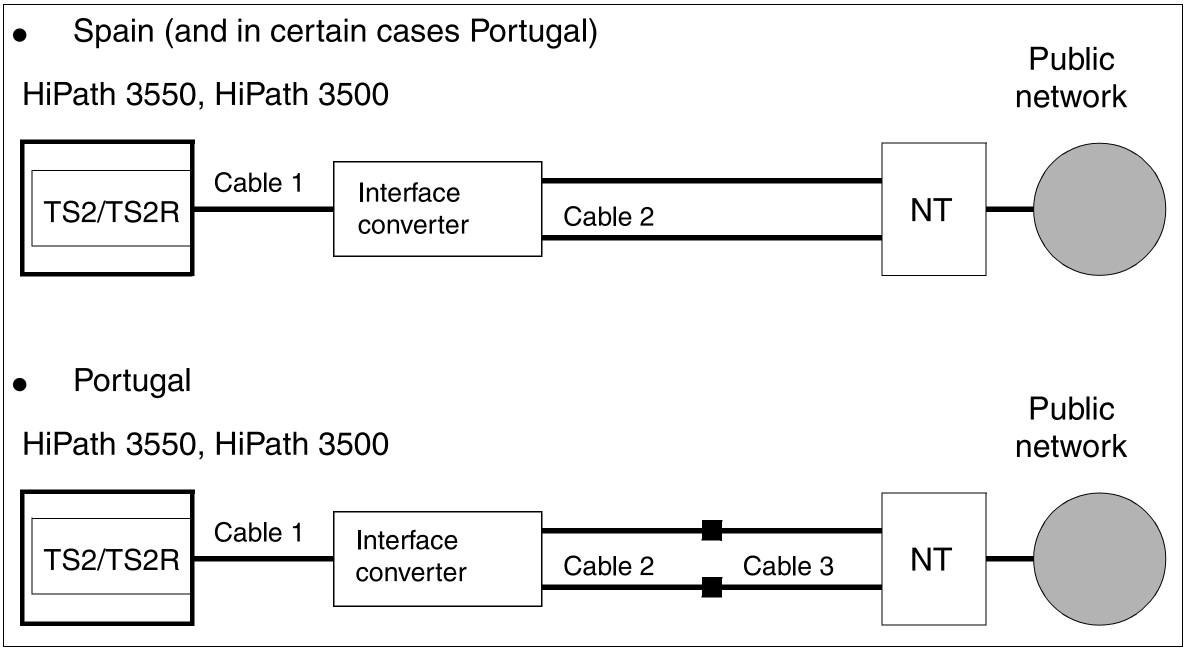

Spain (and in certain cases Portugal)
HiPath 3550, HiPath 3500
Public network
TS2/TS2R
Cable 1
Interface converter
Cable 2
NT
Portugal
HiPath 3550, HiPath 3500
Public network
TS2/TS2R
Cable 1
Interface converter
Cable 2
Cable 3
NT

Figure 3-131 S_{2M} - NT Connections for Spain and Portugal

Connection kit contents and part numbers:

- TS2/TS2R connection kit for Spain and Portugal: F50035-E2-X63 containing the following:
  - Interface converter: S30122-X7357-X
  - Cable 1 = Patch cable MW8 (RJ48C), 10 m: C39195-Z7208-A100
  - Cable 2 (2 units) = coaxial adapter cable, 30 cm: S30267-Z354-A3
- TS2/TS2R upgrade kit for Portugal: L30252-U600-A190 containing the following:
  - Cable 3 (2 units) = Mini-coaxial cable, 10 cm: S30267-Z353-A1

3.3.43 4SLA (Not for U.S.), 8SLA, 16SLA (Not for U.S.)

Introduction

The 4SLA, 8SLA, and 16SLA (**S**ubscriber **L**ine **A**nalog) modules for analog T/R interfaces connect HiPath 3550 and HiPath 3350 (wall housing) to conventional analog telephones and supplementary equipment (such as group 3 fax machines and entrance telephone adapters).

Interfaces

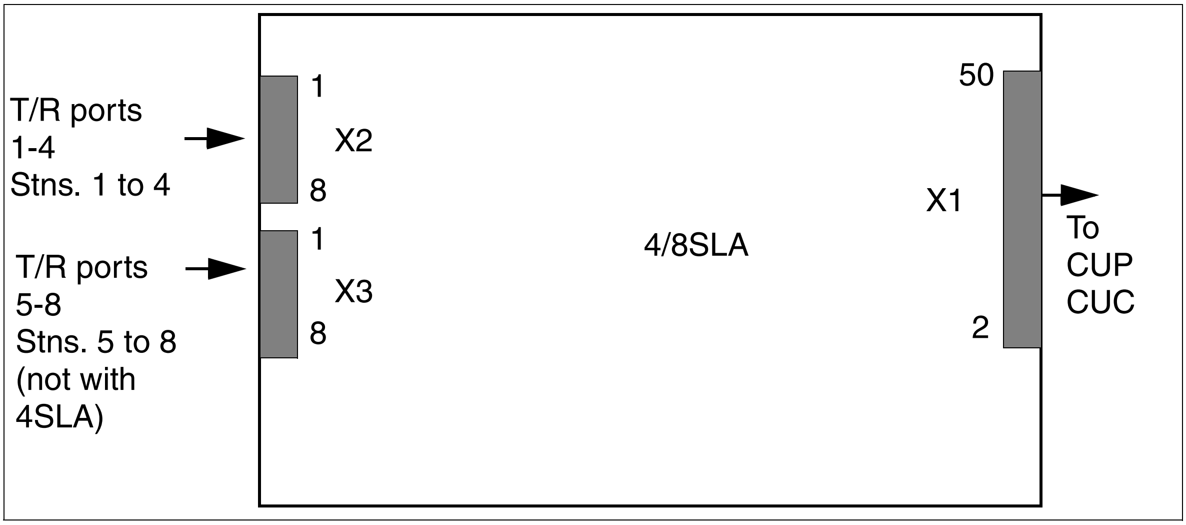

T/R ports
1-4
Stns. 1 to 4
T/R ports
5-8
Stns. 5 to 8
(not with
4SLA)
1
X2
8
1
X3
8
4/8SLA
50
X1
2
To
CUP
CUC

Figure 3-132 4SLA (Not for U.S.), 8SLA - Interfaces (S30810-Q2923-X200, -X100)

Table 3-150 4SLA (Not for U.S.), 8SLA Contact Assignments

Contact	X2 (T/R ports 1 to 4)	X3 (T/R ports 5 to 8)
1	a 1	a 5
2	b 1	b 5
3	a 2	a 6
4	b 2	b 6
5	a 3	a 7
6	b 3	b 7
7	a 4	a 8
8	b 4	b 8

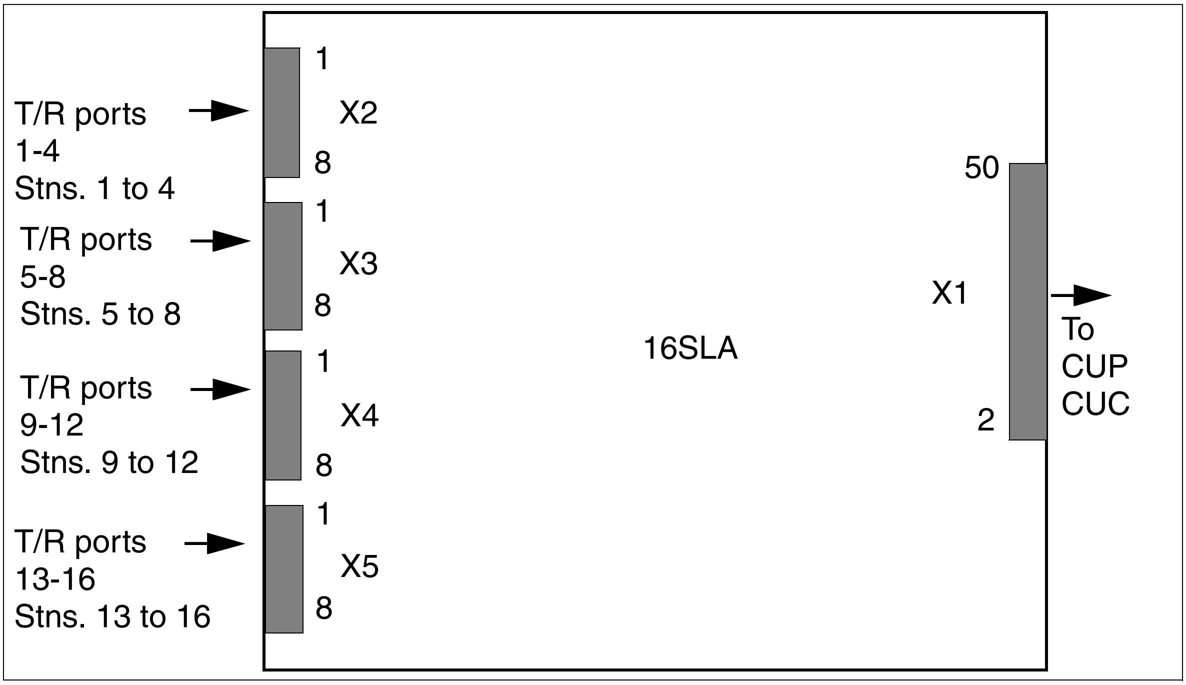

T/R ports
1-4
Stns. 1 to 4
T/R ports
5-8
Stns. 5 to 8
T/R ports
9-12
Stns. 9 to 12
T/R ports
13-16
Stns. 13 to 16
1
X2
8
1
X3
8
1
X4
8
1
X5
8
16SLA
50
X1
2
To
CUP
CUC

Figure 3-133 16SLA (Not for U.S.) - Interfaces (S30810-Q2923-X)

Table 3-151 16SLA (Not for U.S.) - Contact Assignments

Contact	**X2 (T/R ports 1 to 4)**	**X3 (T/R ports 5 to 8)**	**X4 (T/R ports 9 to 12)**	**X5 (T/R ports 13-16)**
1	a 1	a 5	a 9	a 13
2	b 1	b 5	b 9	b 13
3	a 2	a 6	a 1	a 14
4	b 2	b 6	b 10	b 14
5	a 3	a 7	a 11	a 15
6	b 3	b 7	b 11	b 15
7	a 4	a 8	a 12	a 16
8	b 4	b 8	b 12	b 16

The operating mode (short or long line with the appropriate flash times) can be set up for each subscriber line interface with HiPath 3000 Manager E (the menu settings: Set up station –> Station –> Param –> Flags).

Technical connection conditions

- Maximum supply current: approximately 34 mA; maximum supply voltage: approximately 40 Vdc
- Ring voltage against negative supply voltage (a-wire (tip)/RING): two telephones maximum
- Range, see Section 2.6
- Loop current detection > 10 mA
- Ground button detection > 20 mA
- The transmission method can be configured country-specifically by entering the country code.

3.3.44 8SLAR

Introduction

The 8SLAR (**S**ubscriber **L**ine **A**nalog **R**ack) board provides eight T/R interfaces for connecting analog telephones and supplementary equipment (such as group 3 fax machines and TFE adapters) in HiPath 3500 and HiPath 3300 (19-inch housing).

Interfaces

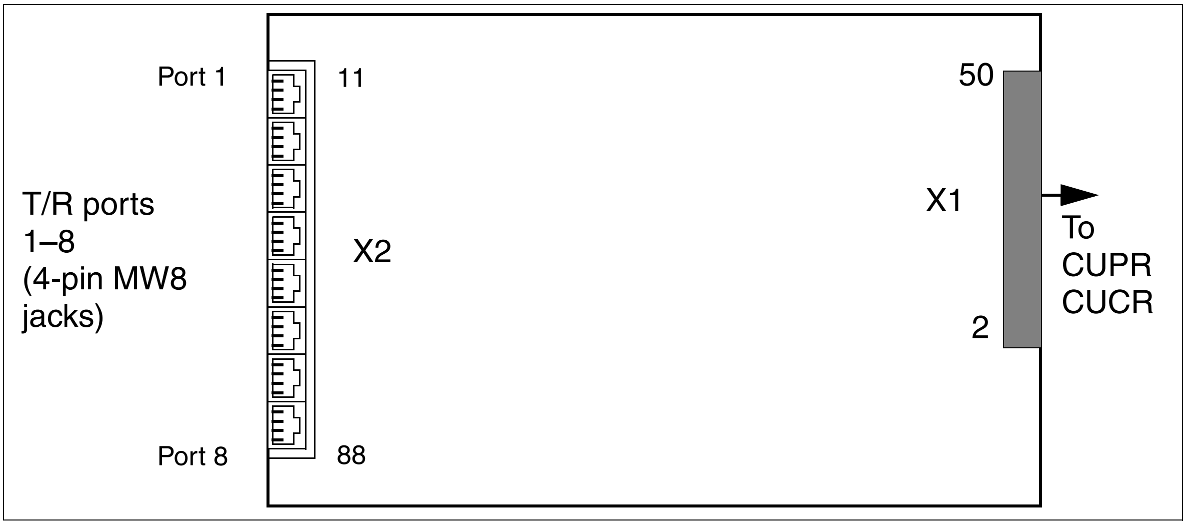


Figure 3-134 8SLAR Interfaces (S30810-K2925-Z)

Table 3-152 8SLAR Contact Assignments

MW8 jack	X2, pin	T/R ports 1-4	MW8 Jack	X2, pin	T/R ports 5-8
1	14	a 1	5	54	a 5
	15	b 1		55	b 5
2	24	a 2	6	64	a 6
	25	b 2		65	b 6
3	34	a 3	7	74	a 7
	35	b 3		75	b 7
4	44	a 4	8	84	a 8
	45	b 4		85	b 8

Technical connection conditions

- Maximum supply current: approximately 34 mA; maximum supply voltage: approximately 40 Vdc
- Ring voltage against negative supply voltage (a-wire (tip)/RING): two telephones maximum
- Range, see Section 2.6
- Loop current detection > 10 mA
- Ground button detection > 20 mA
- The transmission method can be configured country-specifically by entering the country code.

3.4 Options

3.4.1 ALUM4

Introduction

In the event that HiPath 3550 or HiPath 3350 experience a voltage drop, voltage dip or unrecoverable system errors, a trunk failure transfer (ALUM) is activated (MSI only).

The module implements a power failure transfer for four analog telephones. The only kind of telephone that can be used is an analog telephone. The signaling method of the connected telephones should be the same as that on the trunk line, otherwise signaling will not be possible.

When the system is deactivated or if an error occurs, the trunk lines are connected directly to the telephones. When normal operation is resumed, the transfer represented in the figure below takes place.

ALUM4 module function

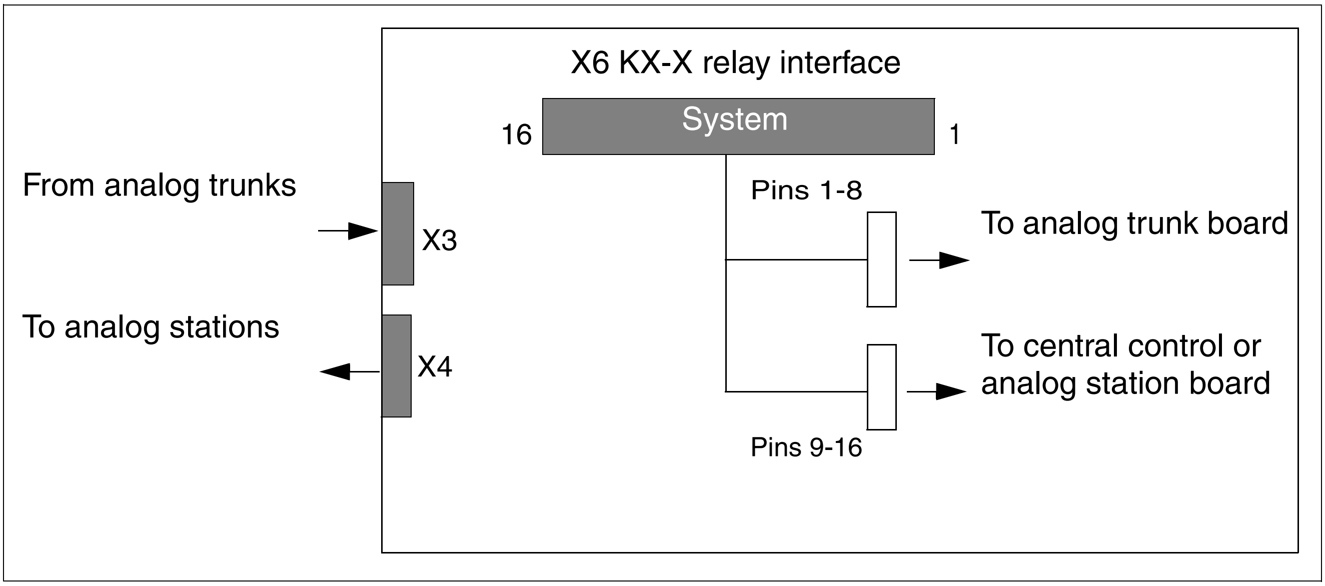

X6 KX-X relay interface
16
System
1
From analog trunks
X3
Pins 1-8
To analog trunk board
To analog stations
X4
To central control or analog station board
Pins 9-16

Figure 3-135 ALUM4 - Function

Interfaces

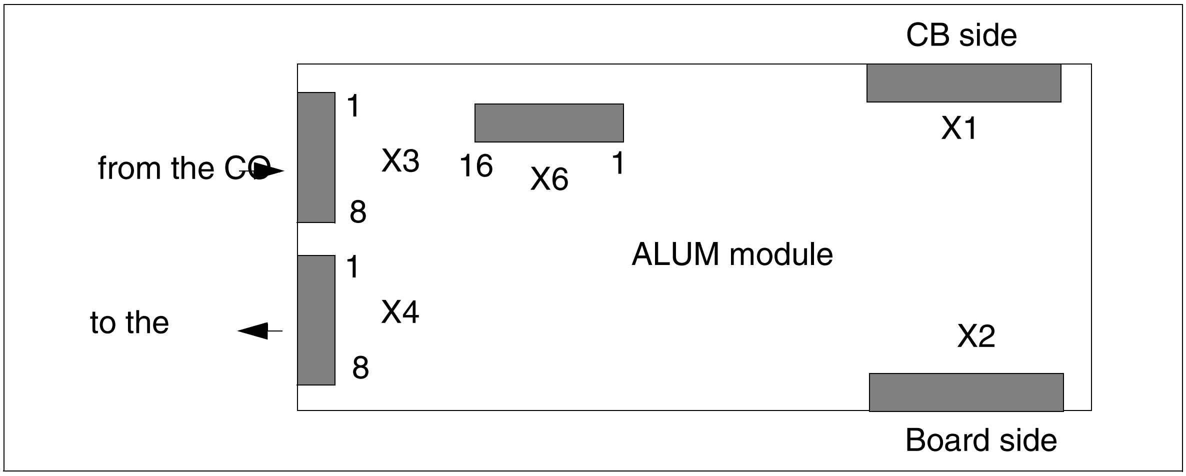


Figure 3-136 ALUM4 - Interfaces (S30817-Q935-A)

The cable that is plugged in by default is split and is connected to the TLA and to the 4/8/16SLA board.

ALUM module contact assignments

Table 3-153 ALUM4 - Interface Assignments (Not for U.S.)

Contact	Connector X3	Connector X4	Connector X6
1	R1 from trunk 1a	AE1 to Stn. 1a	AT1 to TLA a
2	T1 from trunk 1b	BE1 to Stn. 1b	BT1 to TLA b
3	R2 from trunk 2a	AE2 to Stn. 2a	AT2 to TLA a
4	T2 from trunk 2b	BE2 to Stn. 2b	BT2 to TLA b
5	R3 from trunk 3a	AE3 to Stn. 3a	AT3 to TLA a
6	T3 from trunk 3b	BE3 to Stn. 3b	BT3 to TLA b
7	R4 from trunk 4a	AE4 to Stn. 4a	AT4 to TLA a
8	T4 from trunk 4b	BE4 to Stn. 4b	BT4 to TLA b
9	–	–	TA1 to SLA* a
10	–	–	TB1 to SLA* b
11	–	–	TA2 to SLA* a
12	–	–	TB2 to SLA* b

Table 3-153 ALUM4 - Interface Assignments (Not for U.S.)

Contact	Connector X3	Connector X4	Connector X6
13	–	–	TA3 to SLA* a
14	–	–	TB3 to SLA* b
15	–	–	TA4 to SLA* a
16	–	–	TB4 to SLA* b
* = or to free analog port			

Table 3-154 ALUM4 - Interface Assignments (For U.S. Only)

Pin	X3 (to MDF)	X4 (to MDF)	Y-Cable from X6 to TMGL4		Y-Cable from X6 to Analog Ports[1]	
			Pin	Assignment	Pin	Assignment
1	R from trunk 1	R to station 1	1	T to TMGL4 port 1	9	T to analog port 1
2	T from trunk 1	T to station 1	2	R to TMGL4 port 1	10	R to analog port 1
3	R from trunk 2	R to station 2	3	T to TMGL4 port 2	11	T to analog port 2
4	T from trunk 2	T to station 2	4	R to TMGL4 port 2	12	R to analog port 2
5	R from trunk 3	R to station 3	5	T to TMGL4 port 3	13	T to analog port 3
6	T from trunk 3	T to station 3	6	R to TMGL4 port 3	14	R to analog port 3
7	R from trunk 4	R to station 4	7	T to TMGL4 port 4	15	T to analog port 4
8	T from trunk 4	T to station 4	8	R to TMGL4 port 4	16	R to analog port 4
Note: Pinouts shown are at the board itself. The supplied main distribution frame cable (MDF cable) reverses the signal order for X3 and X4 before the MDF.						

[1] To the analog station ports on the CBCC (recommended) or to four consecutive ports on an 8SLA board.

ALUM module block diagram

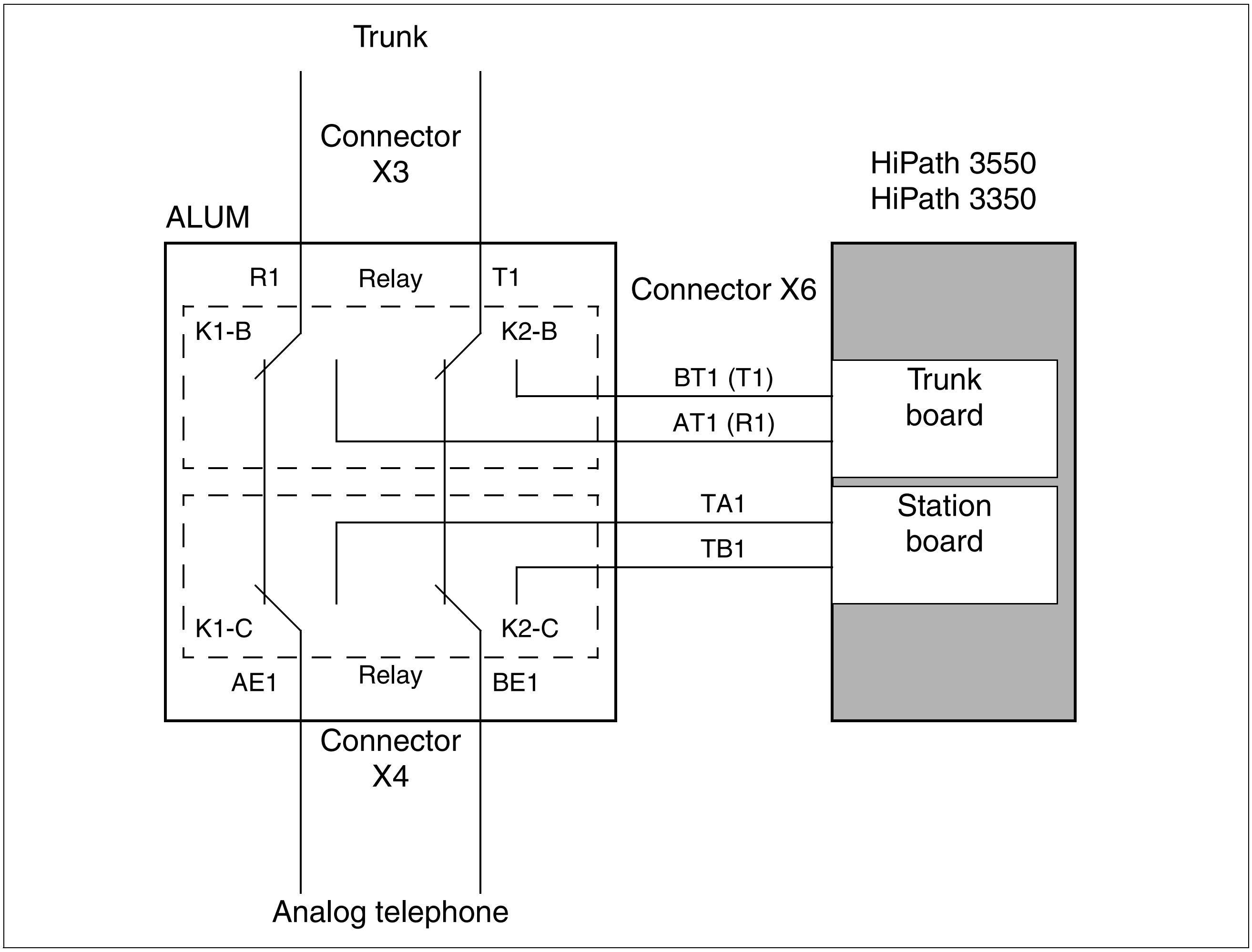

Trunk
Connector X3
ALUM
R1
Relay
T1
K1-B
K2-B
HiPath 3550
HiPath 3350
Connector X6
BT1 (T1)
AT1 (R1)
Trunk board
TA1
TB1
Station board
K1-C
K2-C
AE1
Relay
BE1
Connector X4
Analog telephone

Figure 3-137 ALUM4 - Basic Structure

3.4.2 AMOM

Introduction

AMOM is an opto-electronic converter that can be used to connect fiber optic cables to the Sub-D jacks on the front panel of the DIUN2 and DIU2U boards.

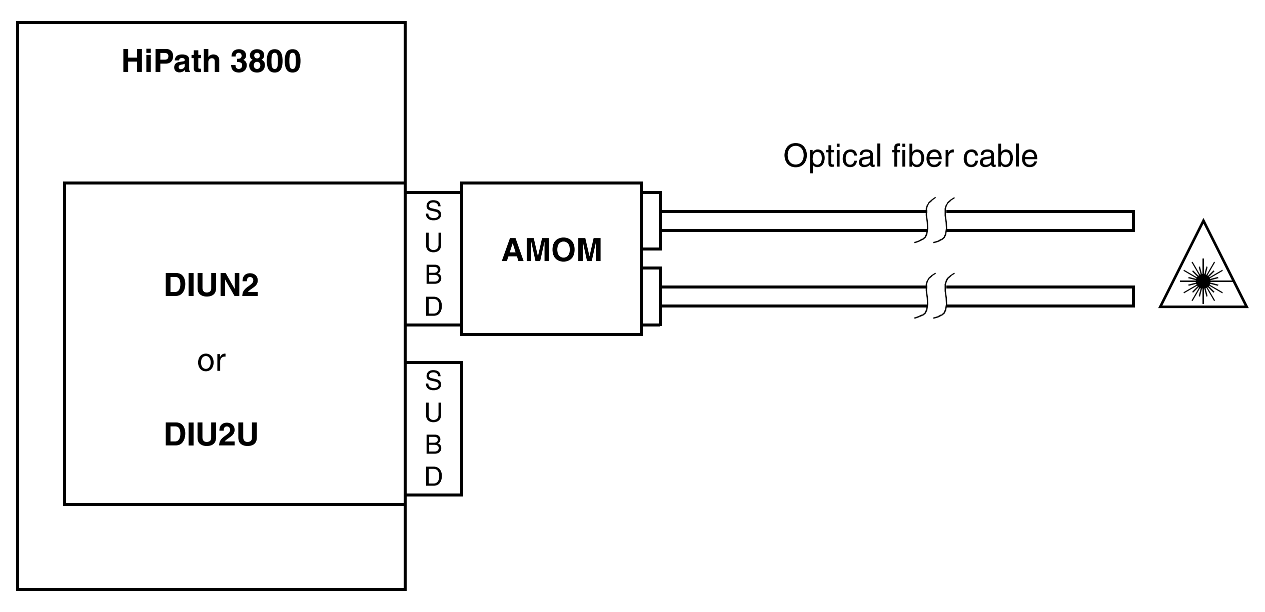


Figure 3-138 AMOM - Connection to DIUN2 and DIU2U

AMOM variants

AMOM variant	Wave length	Op.fiber cable	Cable length (km)	Cable attenuation (dB/km)	Maximum attenuation[1] (dB)
S30807-K5480-X100	850/820 nm multimode	50 µm 62.5 µm	2.5 3	3 3.5	11.5 14.5
S30807-K5480-X200	1300 nm multimode	50 µm and 62.5 µm	6	1	10
S30807-K5480-X300	1300 nm mono mode	9 µm/125	8	0.5	8

[1] Maximum optical attenuation in an AMOM to AMOM connection: a reserve of 4 dB attenuation must be included for ageing and splicing.

Connector assignment

Table 3-155 AMOM - 15-Pin Sub-D Plug Assignment

Pin	Signal	Signal description	Route
4	LWLO0_FRONT	Data output on the optical fiber interface	Input
5	GND	Ground return path for the +5-V power supply	Input/output
6	SCAN_IN0	Adapter test	Output
7	SCAN_IN0	Adapter test	Output
10	+5 V	+5-V power supply	Input
11	LWLI0_FRONT	Data input on the optical fiber interface (front)	Output
12	GND	Ground return path for the +5-V power supply	Input/output
14	+5 V	+5-V power supply	Input
No other pins used.			

3.4.3 ANI4 (for selected countries only)

Introduction

The ANI4 (**A**utomatic **N**umber **I**dentification) board is responsible for receiving station numbers modulated using the CPFSK method, demodulating them, and forwarding them to the base system HiPath 3550 and HiPath 3350. In V4.0 SMR-7 or later, the station name is analyzed in addition to the call number and shown on the telephone display.

Each ANI4 can serve four trunks. It contains the external trunk board hardware interfaces (TMGL4) as well as a trunk and options bus interface. The trunks are transferred directly on the board between the trunk and the trunk board interfaces.

Interfaces on the ANI4 module

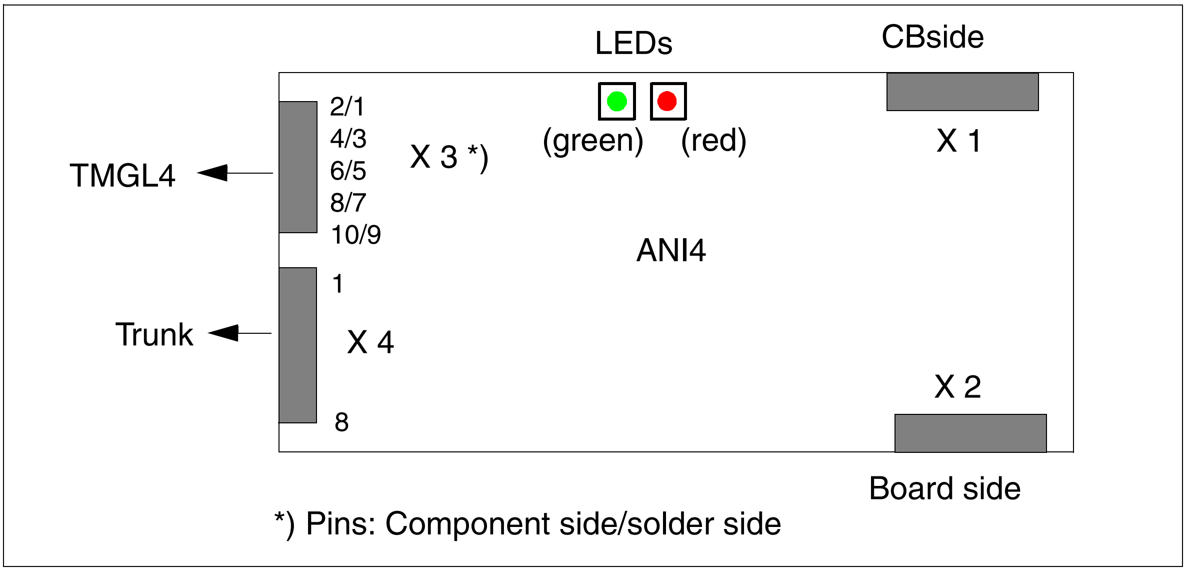


Figure 3-139 ANI4 (For Selected Countries Only) - Interfaces (S30807-Q6917-Axxx)

LED statuses and their meanings

On the ANI4 board two LEDs are implemented that show the status of trunk channel 1.

After system startup the green LED is on and the red LED is off. This signals that the layer-1 firmware has started correctly.

If ANI4 is recognized properly by the system, the green LED is reset (after all system software initialization), and the bottom line of the display on the optiset E or optiPoint 500 phones appears. This means that the ANI4 has received system software activation for all four channels.

Table 3-156 ANI4 (For Selected Countries Only) - LED Statuses for Trunk 1

LED	Meaning	Action
Green LED - Firmware Condition		
Off	No caller ID signals on the line.	Call service provider and ask if feature is available.
	Line is not connected to trunk channel 1.	Connect line to trunk channel 1.
	The incoming signal is lower than –36 dBm (as defined in Bellcore SR3004 for the lowest caller ID signal (space - signal)): the Mitel chip on ANI4 shows no reaction.	Call service provider and ask if feature is available. If so, the signal that appears on the customer side is too low (not Bellcore-compliant). This must be corrected by the service provider.
	The LED or the microcontroller is defective.	Replace ANI4 board.
	The system has not yet started.	Start up system.
On (but glowing weakly)	The Mitel chip interprets the signal on the line as an FSK carrier signal. However, this could mean that there is noise or speech on the line, too. The firmware is in the state of recognition.	–
On (for approx. 1 s)	A valid caller ID signal (correct channel seizure/mark - bit sequence + valid message byte) on the line is being recognized at the moment. If a message is not displayed on the optiset E or optiPoint 500 telephone, there may be too much noise on the line. In other words, some bits in the signal have “tipped over” into the other logical status. The firmware builds the checksum for the received caller ID message byte and compares this checksum with the one received.	–
Red LED - Checksum Status		
On	The received caller ID signal has a checksum error. The LED is reset after the next correct caller ID message is received.	If the red LED is on after every call: the FSK signal is provided, but is not Bellcore-compliant on the customer side. This must be corrected by the service provider.
Off	Checksum is OK.	–

ANI4 module contact assignments

Table 3-157 ANI4 (For Selected Countries Only) - Contact Assignments

Contact	Connector X3 Component Side	Connector X3 Solder Side	Connector X4
1	--	Not assigned	a-wire (tip), trunk 1
2	b-wire (ring), trunk 1	--	b-wire (ring), trunk 1
3	--	a-wire (tip), trunk 1	a-wire (tip), trunk 2
4	b-wire (ring), trunk 2	--	b-wire (ring), trunk 2
5	--	a-wire (tip), trunk 2	a-wire (tip), trunk 3
6	b-wire (ring), trunk 3	--	b-wire (ring), trunk 3
7	--	a-wire (tip), trunk 3	a-wire (tip), trunk 4
8	b-wire (ring), trunk 4	--	b-wire (ring), trunk 4
9	--	a-wire (tip), trunk 4	–
10	GMZ	--	–
GMZ= Call charging module assignment			

ANI4 installation instructions

Follow the steps below to install ANI4 in the HiPath 3550 or HiPath 3350 system.

> ⚠ **Caution**
> Remove the trunk slip-on connectors from the TMGL4 board before starting to work on the system.
> Be sure to reinstall the ANI4 and TMGL4 boards in their slots before reconnecting the trunks.

1. Disconnect the trunks from theTMGL4 board (Figure 3-140: Figure 1).
2. Unplug the system from the power supply.
3. Install the ANI4 board in the system.
4. Connect the OPAL adapter cable to the ANI4 board.
5. Use the ribbon cable supplied with the board to connect ANI4 and TMGL4, making sure that the colored markings (pin 1) at both ends of the cable are facing upwards(Figure 3-140: Figure 2).
6. Connect the trunk slip-on connectors to the ANI4 (Figure 3-140: Figure 3).
7. Restart the system by reconnecting the power plug.

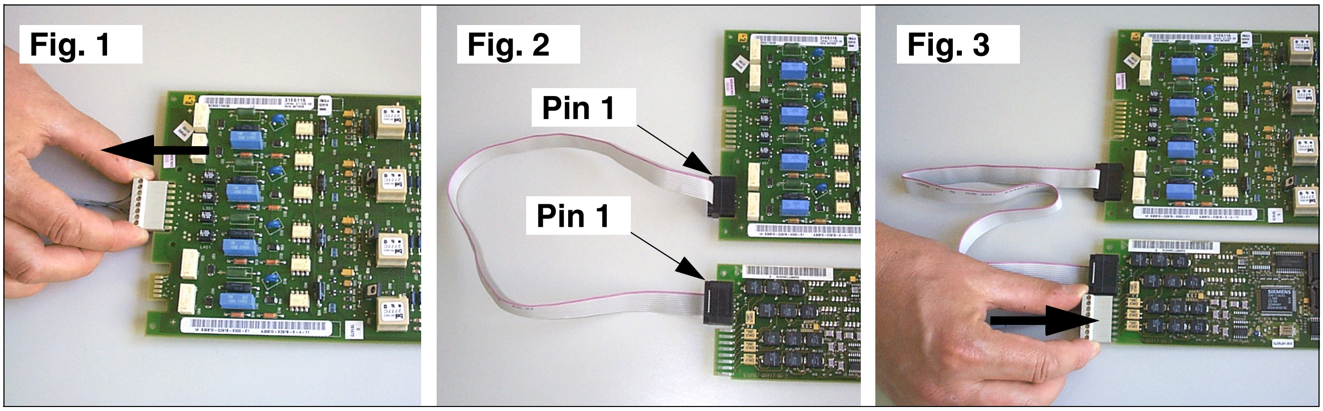


Figure 3-140 ANI4 (For Selected Countries Only) - Installation Steps

3.4.4 ANI4R (for selected countries only)

Introduction

The ANI4R (Automatic Number Identification Rack) board is responsible for receiving station numbers modulated using the CPFSK method, demodulating them, and forwarding them to the HiPath 3500 or HiPath 3300 base system. In V4.0 SMR-7 or later, the station name is analyzed in addition to the call number and shown on the telephone display.

Each ANI4R module can serve four trunks. It contains the external trunk board hardware interfaces (TMGL4R) and the options bus interface.

> If ANI4R is installed as option 1 or 2, TMGL4R board must be inserted in slot 4, 6 or 8 (slots 6 and 8 not available with HiPath 3300).

Interfaces

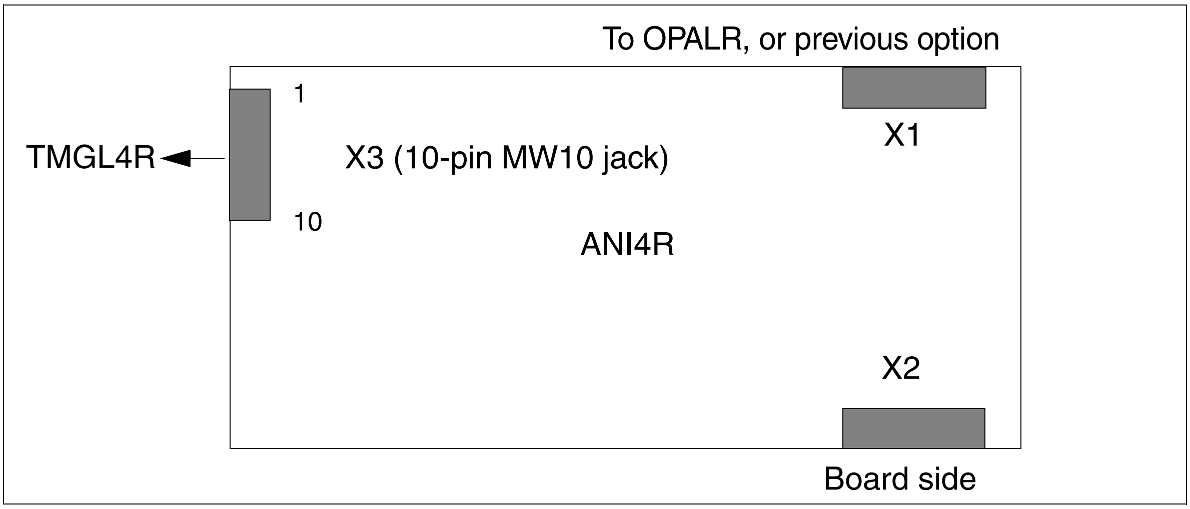


Figure 3-141 ANI4R (for selected countries only) (S30807-Q6917-Z103)

Contact assignment

Table 3-158 ANI4R (For Selected Countries Only) - Contact Assignment

X3 Pin	Signal		X3 Pin	Signal
1	–		6	a-wire (tip), trunk 3
2	a-wire (tip), trunk 1		7	b-wire (ring), trunk 3
3	b-wire (ring), trunk 1		8	a-wire (tip), trunk 4
4	a-wire (tip), trunk 2		9	b-wire (ring), trunk 4
5	b-wire (ring), trunk 2		10	Call charging module assignment (GMZ)

3.4.5 Announcement and Music Modules

Caution
Place the central control board on a flat surface before inserting a subboard. Otherwise you may damage the board.

Introduction

The HiPath 3000 systems use different modules or boards for playing announcements and music on hold. For details on connecting these boards, refer to the manufacturer's installation instructions.

The following HiPath Xpressions Compact boards support music on hold in V4.0 SMR-7 or later and announcements in V5.0 or later:

- IVML8, IVML24 (HiPath 3750, HiPath 3700)
- IVMNL, IVMN8 (HiPath 3800)
- IVMP8 (not for U.S.), IVMP8R (not for U.S) (HiPath 3350, HiPath 3300)
- IVMS8, IVMS8R (HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300)

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product (see Section 1.6, "Information on the Intranet": Electronic Documentation on Com ESY Products).

Overview

Table 3-159 Announcement and Music Modules

Module/ Board	Part number	Notes
EXM	S30817-Q902-B401	• Used in HiPath 3550 and HiPath 3350 (wall housing), see Figure 3-142. • Connected via cable to X4 connector on CBCC/CBCP.
EXMR	S30122-K7403-Z	• Used in HiPath 3500 and HiPath 3300 (19-inch housing). • Board installed directly on CBRC (X19 and X20). • Connected via cable to Cinch jack on the front panel (see Figure 3-143).
MPPI	S30122-K7275-B	• Used in all HiPath 3000 systems • Board installed directly on the central control board (X19 and X20).
MPPI (not for U.S.)	S30122-K5380-X200	• Used in HiPath 3550 and HiPath 3350 (wall housing). • Connected via cable to X4 connector on CBCC/CBCP.

Table 3-159 Announcement and Music Modules

Module/ Board	Part number	Notes
UAM (not for U.S.)	S30122-X7217-X	● Used in HiPath 3550 and HiPath 3350 (wall housing). ● Connected to OPAL and analog interface (for the announcement function)
UAMR (not for U.S.)	S30122-X7402-Z	● Used in HiPath 3500 and HiPath 3300 (19-inch housing). ● Connected to OPALR and analog interface (for the announcement function).

Notes on displaying options

You can use HiPath 3000 Manager E to display the presence of options. The presence of MPPI or UAM (HiPath 3550 and HiPath 3350 only) is displayed as “Option 5”.

The ALUM4 module cannot be displayed.

Slot for EXM

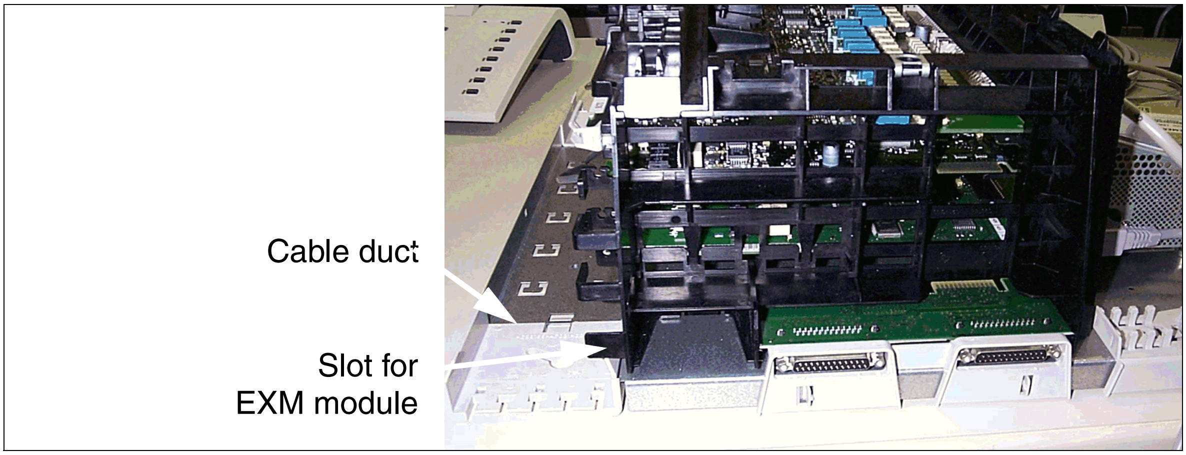


Figure 3-142 EXM Slot for HiPath 3550 and HiPath 3350 Wall Housing

Connection of EXMR

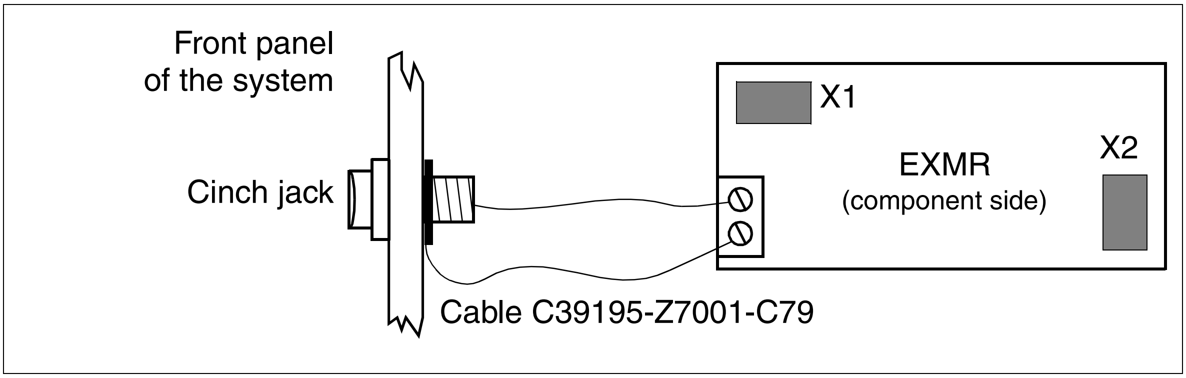

Front panel
of the system
Cinch jack
Cable C39195-Z7001-C79
X1
X2
EXMR
(component side)

Figure 3-143 EXMR Connection to HiPath 3500 and HiPath 3300

3.4.6 EVM

Introduction

The optional subboard EVM (**E**ntry **V**oice **M**ail) provides the functionality of integrated Voice Mail in HiPath 3550, HiPath 3350,HiPath 3500 and HiPath 3300. The central control boards S30810-Q2935-A301 (CBCC) and S30810-Q2935-Z301 (CBRC) must be used for this.

The board is plugged directly into the X32 connector on the central control boards CBCC (see Figure 3-1) or CBRC (see Figure 3-2) using the connector strip X2.

Caution
The EVM subboard must not be plugged in or out when the system is energized.
Place the central control board on a flat surface before inserting the EVM subboard.
The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-144).
Otherwise you may damage the board.

HiPath Entry Voice Mail has capacity to store up to two hours of recorded messages. You can create up to

- 24 standard mailboxes and
- four Auto Attendant mailboxes.

Information on administering HiPath Entry Voice Mail for HiPath 3000 can be found in the HiPath 3000 Manager E Help.

Caution
If using a different voicemail application (such as HiPath Xpressions Compact), the EVM voice mail ports must be deactivated. To do this, set the ports to the "Standard" station type and remove them from the active voicemail hunt group. Next set the number of mailboxes for autoconfiguration to "0". This prevents the user making accidental changes to Call Management.

Interfaces

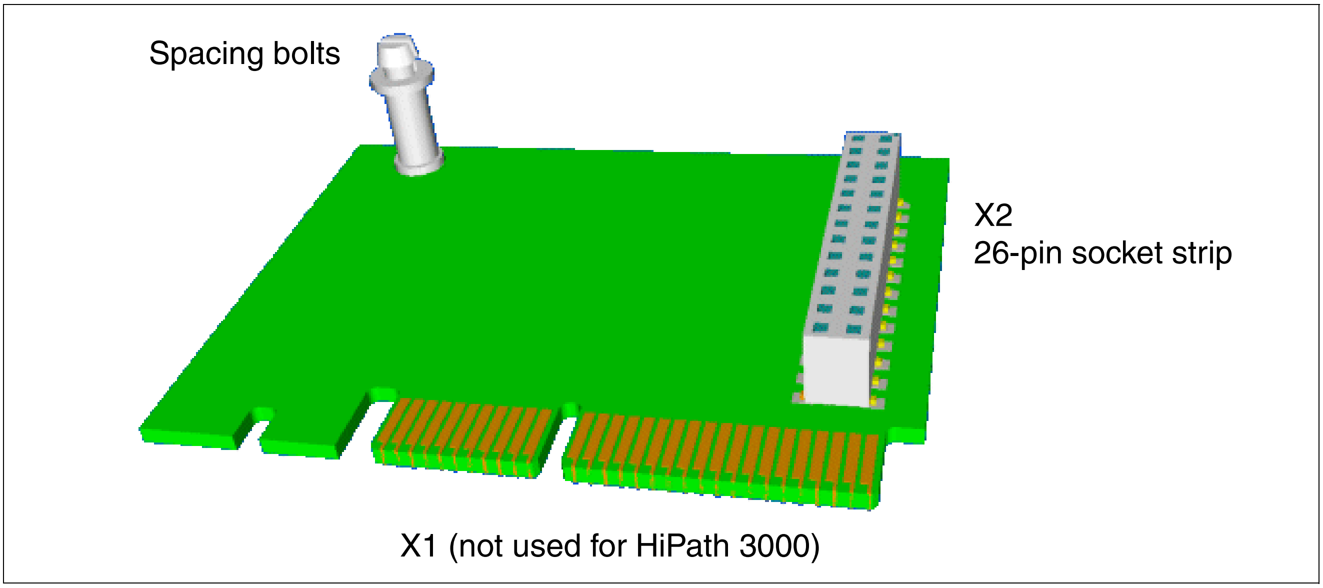

Spacing bolts
X2
26-pin socket strip
X1 (not used for HiPath 3000)

Figure 3-144 EVM (S30807-Q6945-X) - Interfaces

3.4.7 EXMNA (for U.S. only)

Introduction

The EXMNA (external music on hold) module provides a connection for external music on hold in HiPath 3550 and HiPath 3350.

The EXMNA connects to the CBCC and CBCP board (connector X4) by means of a ribbon cable.

- Ribbon cable connected = External music
- Ribbon cable not connected = Internal music

Expert mode code 22 11 allows you to choose between music on, music off, ring tone, or music on unscreened transfer. If the EXMNA module is connected, you must select Music on using Assistant T or HiPath 3000 Manager E. The module is operational as soon as it is plugged in.

Interfaces

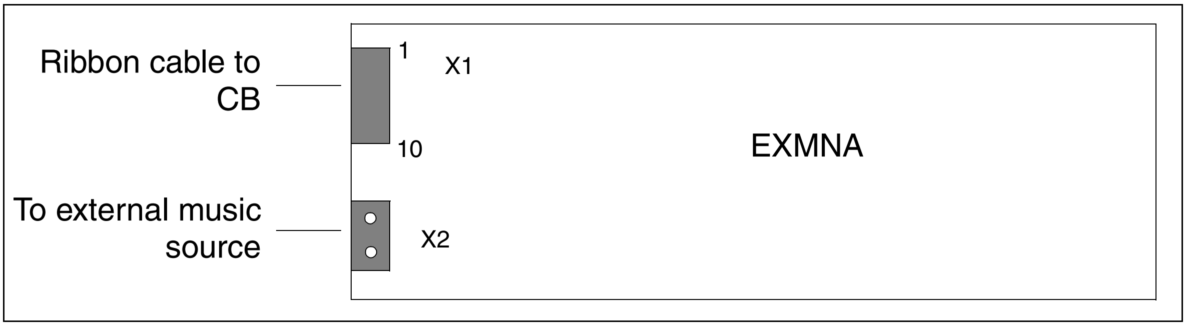


Figure 3-145 EXMNA (For U.S. Only) (S30807-Q6923-X)

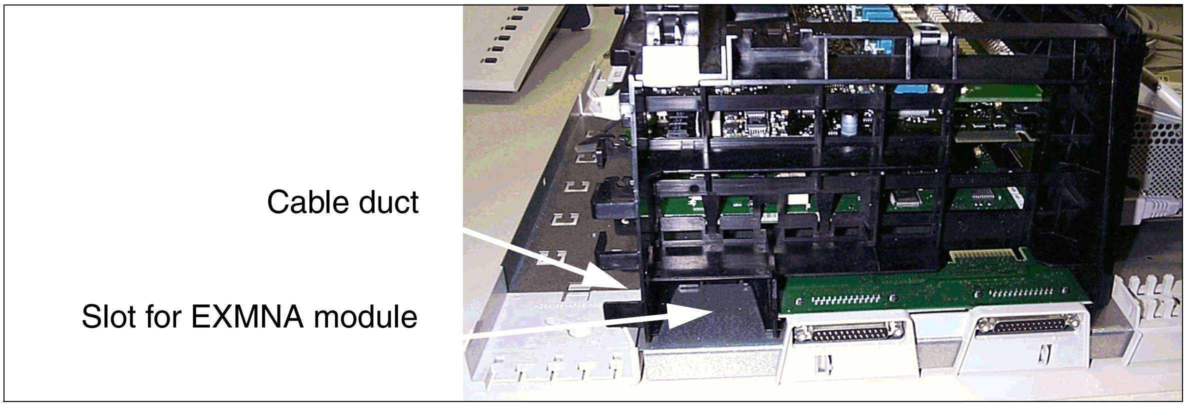


Figure 3-146 EXMNA (for U.S. only) - Slot for HiPath 3550 and HiPath 3350

Contact assignment

Table 3-160 EXMNA (for U.S. only) - Contact Assignments

Contact	Connector X1	Connector X2
1	GND	Input
2	Not assigned	Input
3	Not assigned	Not assigned
4	EXMCL	Not assigned
5	EXMDIR	
6	HRES	
7	EXMD	
8	EXMDET	
9	+5 V	
10	Not assigned	

3.4.8 GEE8 (not for U.S)

Introduction

The **C**all **M**etering **R**eceiving Equipment GEE8 (12/16 kHz) can be plugged into the TML8W board to record call charge pulses (HiPath 3750 and HiPath 3700).

Interfaces X10 and X11 connect to the board.

Switch for setting the level per circuit

- On = – 24 dBm
- Off = – 10 dBm

Switch on GEE8

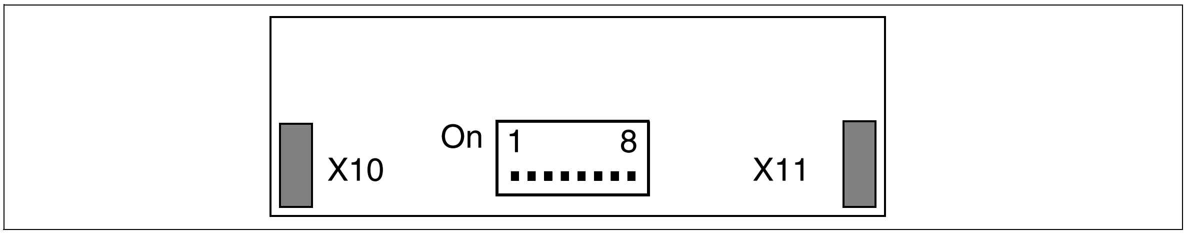


Figure 3-147 GEE8 (Not for U.S.) (S30817-Q664-xxxx)

3.4.9 GEE12 (nor for U.S.), GEE16 (not for U.S.), GEE50 (not for U.S.)

Introduction

Each of the modules listed below supports four call-metering receiving units for recording and preprocessing call charge pulses in HiPath 3550 and HiPath 3350.

Table 3-161 GEE12/GEE16/GEE50 (Not for U.S.) Modules

Module	Frequency	Remarks
GEE 12	12 kHz	also for Silent Reversal
GEE 16	16 kHz	
GEE 50	50 Hz	

The call charge detection channel is looped in the trunk and then routed to the TLA

Interfaces

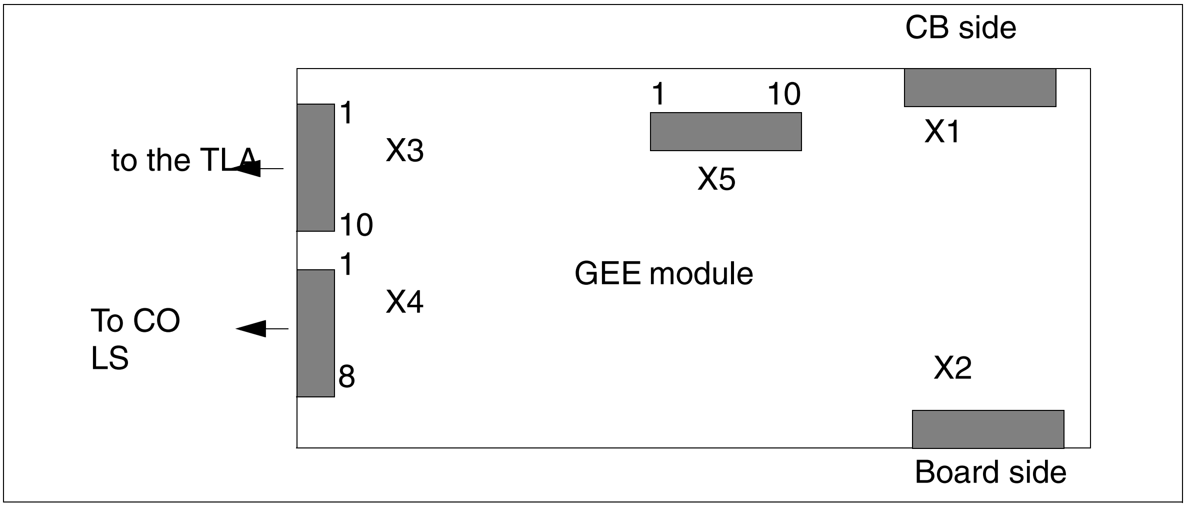


Figure 3-148 GEE12, GEE16, GEE50 (Not for U.S.) - Interfaces (S30817-Q951-Axxx)

Contact assignments

Table 3-162 GEE12, GEE16, GEE50 (Not for U.S.) - Contact Assignments

Contact		**Connector X3**	**Connector X4**	**Connector X5**
1	a	GND *	CO 1 (AL1)	0V
2	b	CO 1 (BN 1)	CO 1 (BL1)	0V
3	a	CO 1 (AN 1)	CO 2 (AL2)	RTS
4	b	CO 2 (BN 2)	CO 2 (BL2)	CTS
5	a	CO 2 (AN 2)	CO 3 (AL3)	RxD
6	b	CO 3 (BN 3)	CO 3 (BL3)	TxD
7	a	CO 3 (AN 3)	CO 4 (AL4)	0V
8	b	CO 4 (BN 4)	CO 4 (BL4)	+5V
9	a	CO 4 (AN 4)	–	0V
10		Call charging module assignment	–	+5V
* for GEE 50 in France; otherwise free				

3.4.10 HOPE (for U.S. only)

Introduction

The HOPE (Hicom Office PhoneMail Entry) board provides Hicom Office PhoneMail Entry functions.

> The HOPE board does not identify itself to the system and is therefore not visible in the HiPath 3000 Manager E card map. When expanding a system (such as HiPath 3350 or HiPath 3550), ensure that a free slot is available.

Interfaces

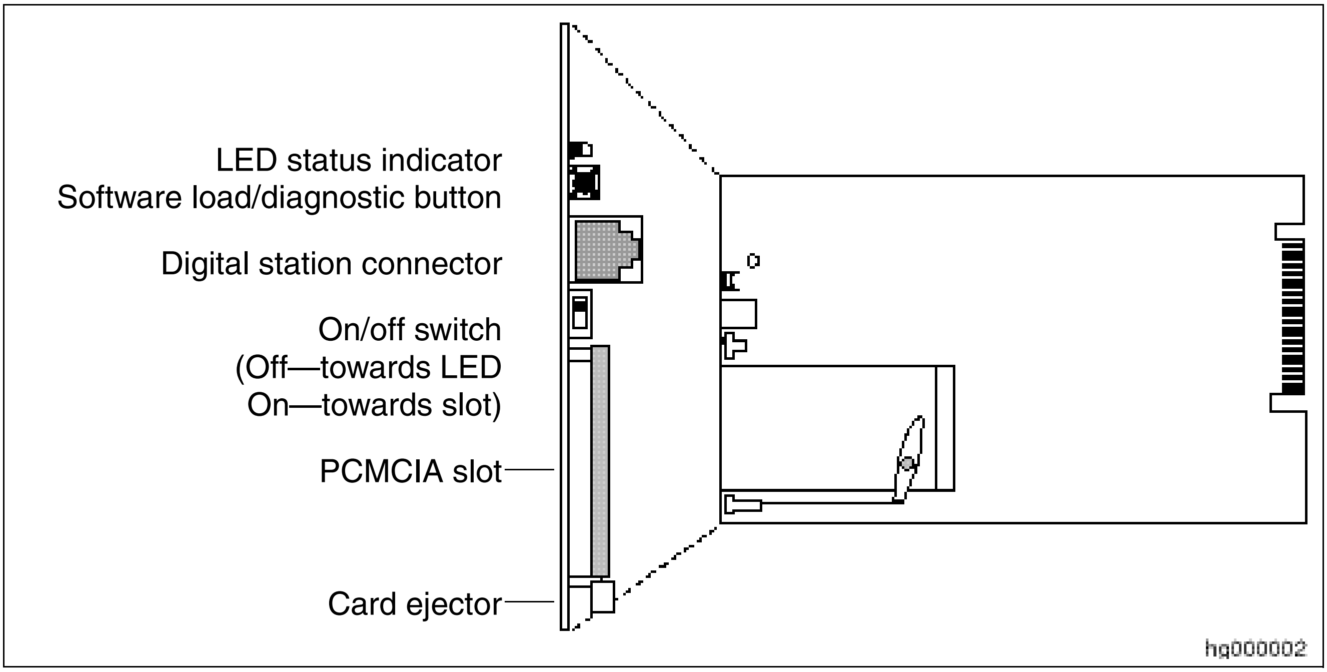

LED status indicator
Software load/diagnostic button
Digital station connector
On/off switch
(Off—towards LED
On—towards slot)
PCMCIA slot
Card ejector
hq000002

Figure 3-149 HOPE (For U.S. Only) (S30122-Q7078-X; S30122-Q7079-X)

Board components

The following list describes the purpose of the components on the HOPE board:

- The LED status indicator signals the state of the Hicom Office PhoneMail system
- The software load/diagnostic button is for software loads (for example, loading a specific language).
- The digital station connector connects the HOPE board to the corresponding digital ports, using a modular cable

- The on/off switch turns the Office PhoneMail system on and off
- The PCMCIA slot is for Office PhoneMail software cards (for example, voice cards).
- The card ejector ejects the software cards from the PMCIA slot

Installation, servicing, and connectivity

For information on installing, connecting, and servicing the HOPE board, refer to the Hicom Office PhoneMail Entry Installation and System Administration Guide.

3.4.11 OPAL and OPALR

Introduction

The adapter cable for connecting the central board to the first optional board comes in two versions:

- OPAL **(Op**tions **A**dapter Cable **L**ong) C39195-A7001-B130 (Figure 3-150 - for use in HiPath 3550 and HiPath 3350 (wall housing).
- OPALR **(Op**tions **A**dapter Cable **L**ong **R**ack) C39195-A7001-B142 (Figure 3-151) - for use in HiPath 3500 and HiPath 3300 (19-inch housing).

OPAL interfaces

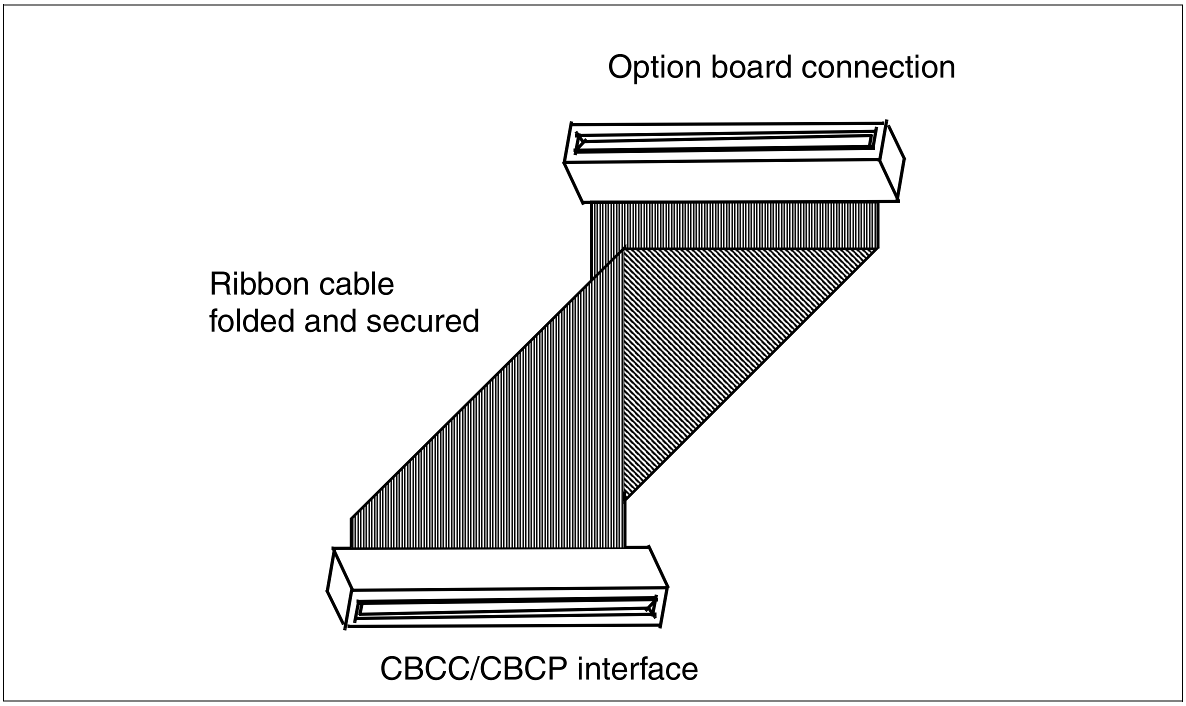

Option board connection
Ribbon cable
folded and secured
CBCC/CBCP interface

Figure 3-150 OPAL (C39195-A7001-B130)

OPALR interface

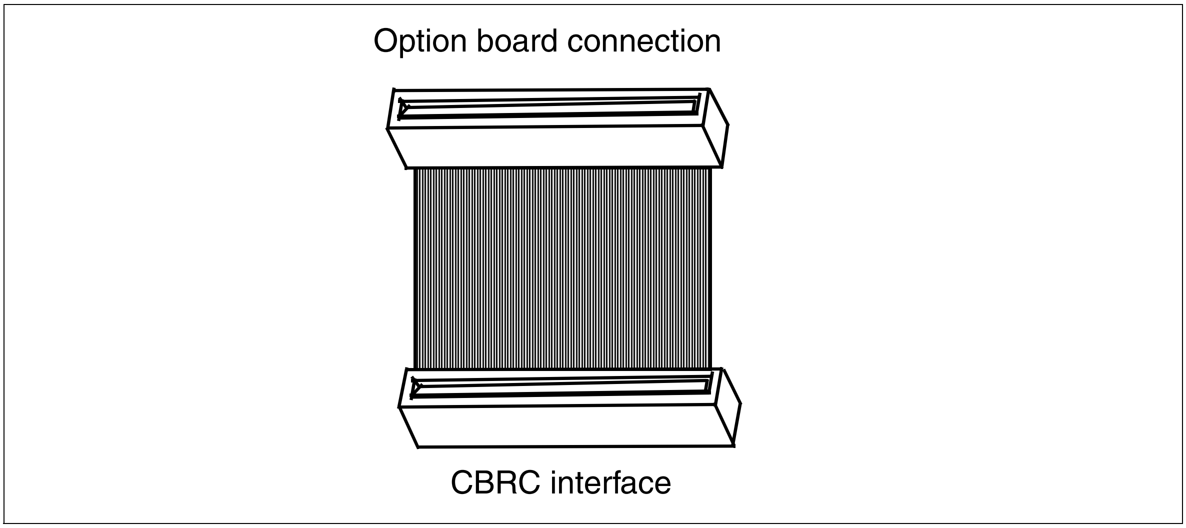

Option board connection
CBRC interface

Figure 3-151 OPALR (C39195-A7001-B142)

3.4.12 PFT1 (Not for U.S.), PFT4 (Not for U.S.)

Introduction

In the event of a power failure or system error in HiPath 3800 and HiPath 3750, up to

- 1 analog trunk with a PFT1 (**P**ower **F**ailure **Transfer**) board
- 4 analog trunks with a PFT4 board

can be transferred (ALUM) to designated analog telephones (Figure 3-152).
When using an analog telephone for outgoing calls, you may need to adapt its signaling method to match the signaling method of the connected trunk.

ALUM using PFT1/PFT4

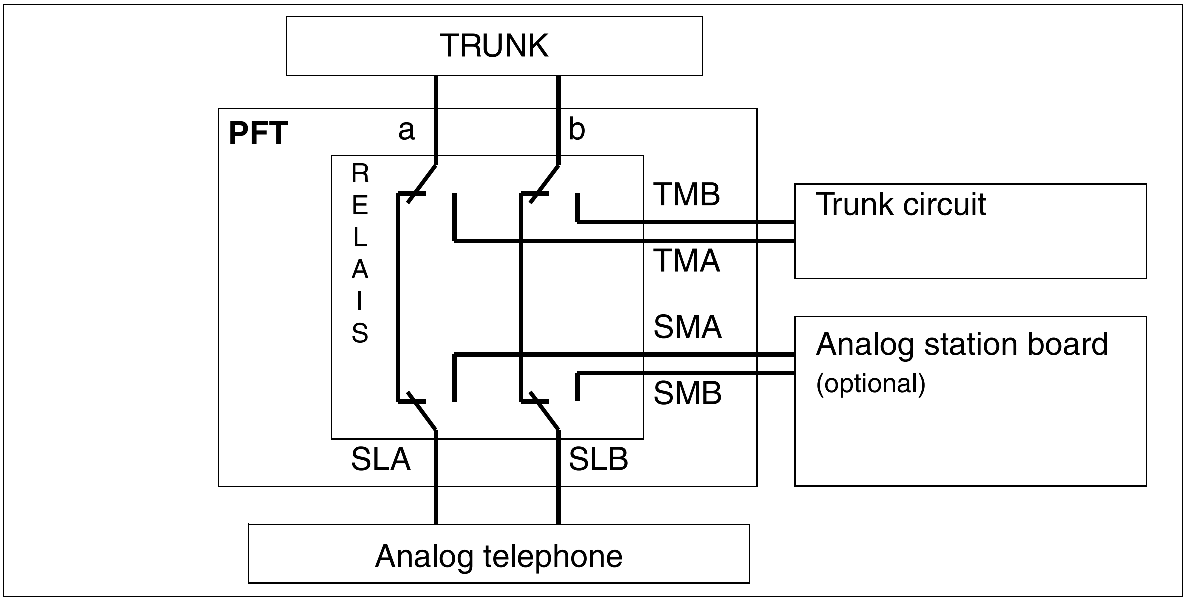

TRUNK
PFT
a
b
R
E
L
A
I
S
TMB
TMA
SMA
SMB
Trunk circuit
Analog station board
(optional)
SLA
SLB
Analog telephone

Figure 3-152 ALUM Using PFT1/PFT4 (Not for U.S.)

Installation location of the PFT1 and PFT4 board (MDFU/MDFU-E)

Wire PFT1 or PFT4 into the MDFU or MDFU-E. The boards require -48 V. For the assignments of both boards, see Figure 3-154.

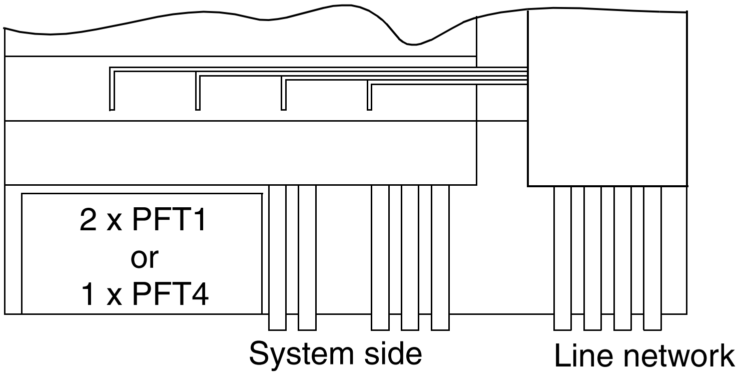
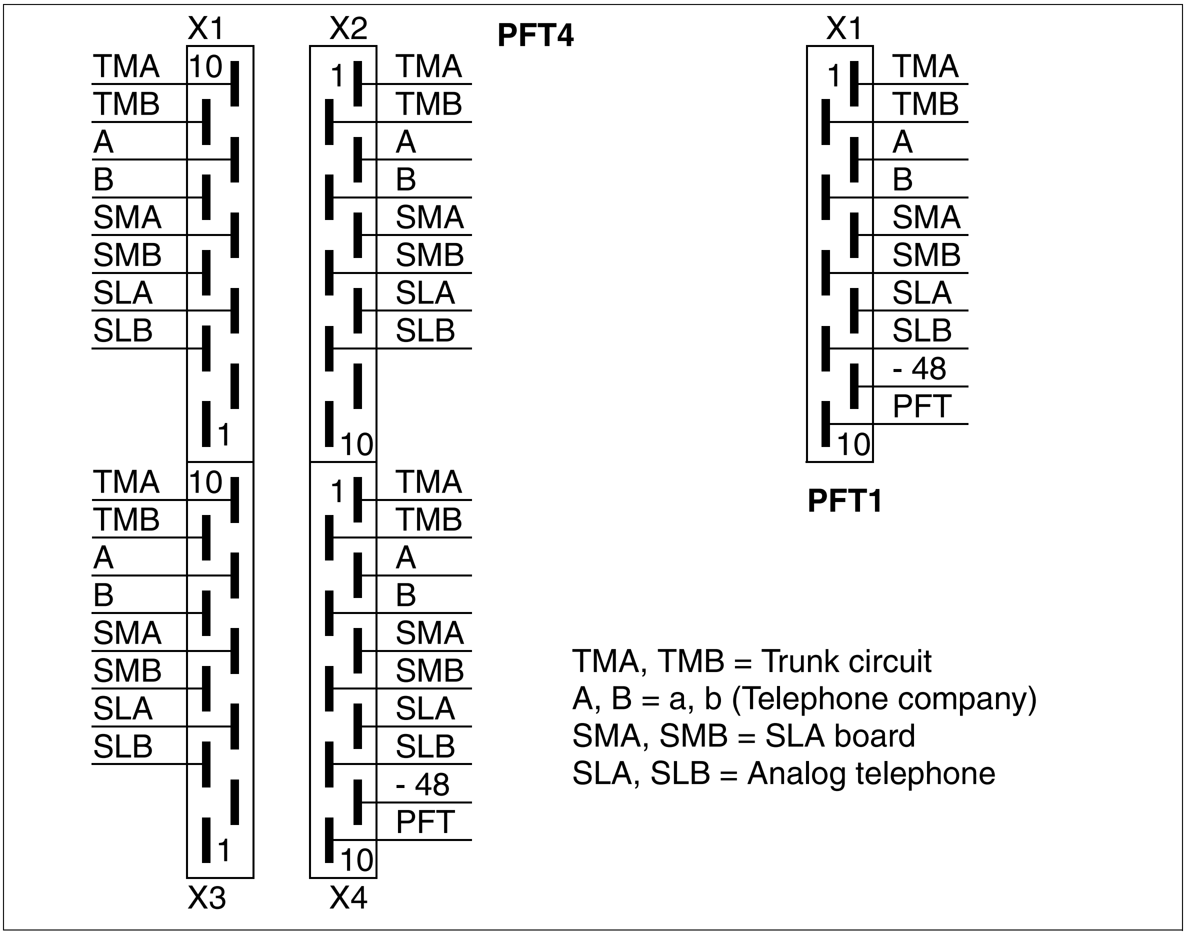

2 x PFT1
or
1 x PFT4
System side
Line network

Figure 3-153 Installation Location of PFT1 and PFT4 (MDFU/MDFU-E) (Not for U.S.)

PFT1 and PFT4 board assignment


PFT4
X1
X2
X3
X4
TMA
TMB
A
B
SMA
SMB
SLA
SLB
- 48
PFT
1
10
X1
PFT1

TMA, TMB = Trunk circuit
A, B = a, b (Telephone company)
SMA, SMB = SLA board
SLA, SLB = Analog telephone

Figure 3-154 PFT1 (S30777-Q539-X) and PFT4 (S30777-Q540-X) Board Assignment

3.4.13 REAL

Functions

The tasks of the REAL (S30807-Q5913-X) board in HiPath 3750 and HiPath 3700 are divided into two functional areas (see Figure 3-156):

- Relay (**RE**AL)
  Four individual, controllable relays (K1 to K4) are available for special connections. The relays are energized by the CBCPR board via the REAL socket X05 connection cable. The switch contacts for all relays are floating and protected by surge protectors.

  In addition, a - 48-V line fused using a PTC resistor is routed to MDFU/MDFU-E and can be used there for external applications (max. 80 mA).
  - 48-V lines are provided at pins 17 and 37 (SU connector X06) for external applications with higher power requirements. These lines have a load capacity of max. 15 W.

- Power Failure Transfer ALUM (RE**AL**)
  This function is provided by two relays (K5, K6) with two switch contacts each. In the event of a power failure or a system restart or reload, an analog trunk is transferred from the system to an analog telephone. The system monitors the line’s loop current to avoid disconnecting any trunk calls in progress when the power is restored.

  In normal mode, the relays are activated:

  – The trunk is connected to the line trunk module.

  – The subscriber line is connected to the subscriber line module.

  In the event of a power failure or during a restart or reload (low potential of trunk failure transfer signal from CBCPR), the relays are deactivated giving rise to the following situation:

  – The signals to the line trunk module and subscriber line module are split and the trunk is connected directly to the subscriber line.

  If the power supply voltage returns after an interruption and a trunk call is in progress, activation of the trunk failure transfer relay is prevented (by optocoupler).

Relay specifications

Electrical characteristics of the relays are as follows:

- Operating voltage: 12 Vdc
- Trunk failure transfer power consumption: 40 mA at 12 V nominal voltage
- Power consumption per relay: 20 mA at 12 V nominal voltage
- Trunk failure transfer contact load: 60 mA at -60 V nominal voltage
- Maximum trunk failure transfer contact load with atmospheric influence: 8 A
- Contact load for relays K1 to K4: 1 A with 250 Vac
- Maximum current drain - 48 VF: 80 mA

Installation location of the REAL board (backplane)

The REAL board (basic cabinet only) is connected to the backplane using a ribbon cable (X05). It is connected to the MDFU or MDFU-E or the patch panel using an SU cable connector X06.

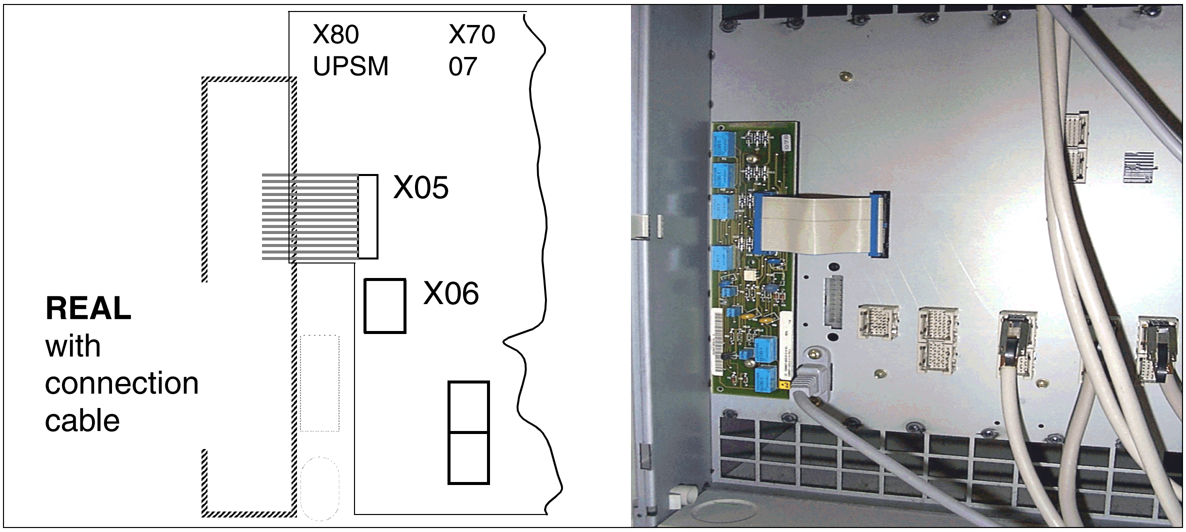
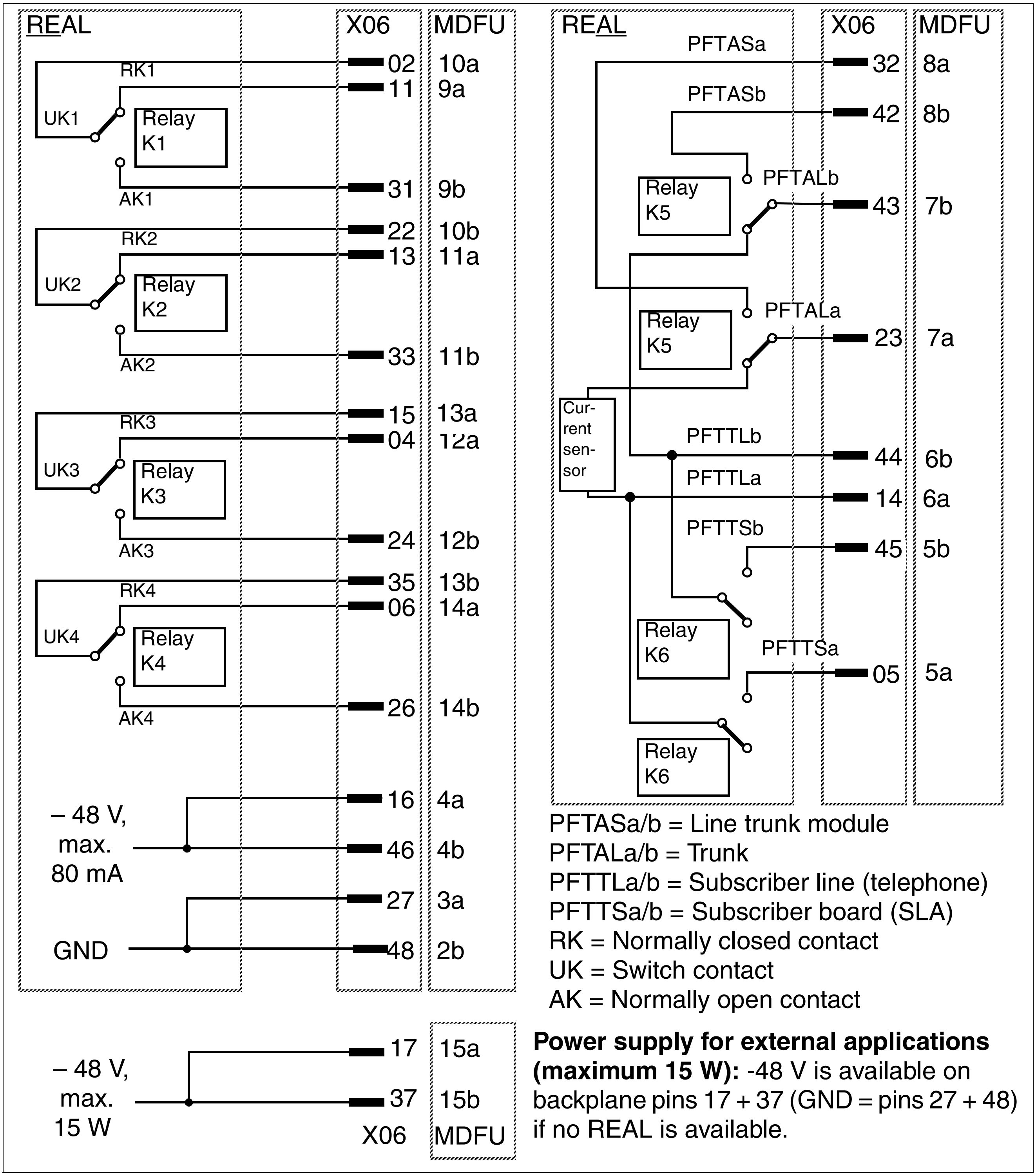


Figure 3-155 Installation Location of the REAL Board

Relay contacts of the REAL board


REAL
X06
MDFU
RK1
02 10a
11 9a
UK1
Relay K1
31 9b
AK1
RK2
22 10b
13 11a
UK2
Relay K2
33 11b
AK2
RK3
15 13a
04 12a
UK3
Relay K3
24 12b
AK3
RK4
35 13b
06 14a
UK4
Relay K4
26 14b
AK4
– 48 V, max. 80 mA
16 4a
46 4b
GND
27 3a
48 2b
– 48 V, max. 15 W
17 15a
37 15b
X06
MDFU
REAL
X06
MDFU
PFTASa
32 8a
PFTASb
42 8b
Relay K5
PFTALb
43 7b
PFTALa
Relay K5
23 7a
Cur-rent sen-sor
PFTTLb
44 6b
PFTTLa
14 6a
PFTTSb
45 5b
Relay K6
PFTTSa
05 5a
Relay K6

PFTASa/b = Line trunk module
PFTALa/b = Trunk
PFTTLa/b = Subscriber line (telephone)
PFTTSa/b = Subscriber board (SLA)
RK = Normally closed contact
UK = Switch contact
AK = Normally open contact

Power supply for external applications (maximum 15 W): -48 V is available on backplane pins 17 + 37 (GND = pins 27 + 48) if no REAL is available.

Figure 3-156 REAL - Relay Contacts (De-Energized) and MDFU Interfaces

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-163 REAL - Cable and Connector Assignment

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	SU connector	REAL	MDFU/ MDFU-E	S_0 patch panel	
				BP: X06			MW8 pin	
1	1	wht/blu		19		1a		
			blu/wht	39		1b		
	2	wht/ora		38		2a		
			ora/wht	48	GND	2b		
	3	wht/grn		27	GND	3a		
			grn/wht	47		3b		
	4	wht/brn		16	– 48 V (max. 80 mA)	4a		
			brn/wht	46	– 48 V (max. 80 mA)	4b		
	5	wht/gry		05	PFTTSa	5a	4	Station board (SLA)
			gry/wht	45	PFTTSb	5b	5	
2	6	red/blu		14	PFTTLa	6a	4	Subsc. line (telephone)
			blu/red	44	PFTTLb	6b	5	
	7	red/ora		23	PFTALa	7a	4	Trunk
			ora/red	43	PFTALb	7b	5	
	8	red/grn		32	PFTASa	8a	4	Circuit board
			grn/red	42	PFTASb	8b	5	
	9	red/brn		11	RK1, opener	9a	3	
			brn/red	31	AK1, closer	9b	2	
	10	red/gry		02	UK1	10a	1	
			gry/red	22	UK2	10b	3	
3	11	blk/blu		13	RK2, opener	11a	2	
			blu/blk	33	AK2, closer	11b	1	
	12	blk/ora		04	RK3, opener	12a	3	
			ora/blk	24	AK3, closer	12b	2	
	13	blk/grn		15	UK3	13a	1	
			grn/blk	35	UK4	13b	3	
	14	blk/brn		06	RK4, opener	14a	2	
			brn/blk	26	AK4, closer	14b	1	
	15	blk/gry		17	– 48 V (15 W max.)	15a		
			gry/blk	37	– 48 V (15 W max.)	15b		
4	16	yel/blu		08		16a		
			blu/yel	28		16b		

3.4.14 REALS

Introduction

The REALS (**Re**lais and **AL**UM for **S**APP) board is used in HiPath 3800 to provide the following functions:

- Four individual, controllable relays are available for special connections, such as door openers.
  The switch contacts for all relays are floating and protected by surge protectors.

  Electrical characteristics of the relays are as follows:

  – Maximum current drain at – 48 V: 80 mA

  – Operating voltage: + 5 V

  – Contact current: max. 1.25 A

  – Contact power: max. 30 W

- Trunk failure transfer (ALUM)
  In the event of a power failure or a system restart or reload, an analog trunk is transferred from the system to an analog telephone. If the power supply voltage returns after an interruption and a trunk call is in progress, activation of the trunk failure transfer relay is prevented by optocoupler.

  ALUM relay electrical data:

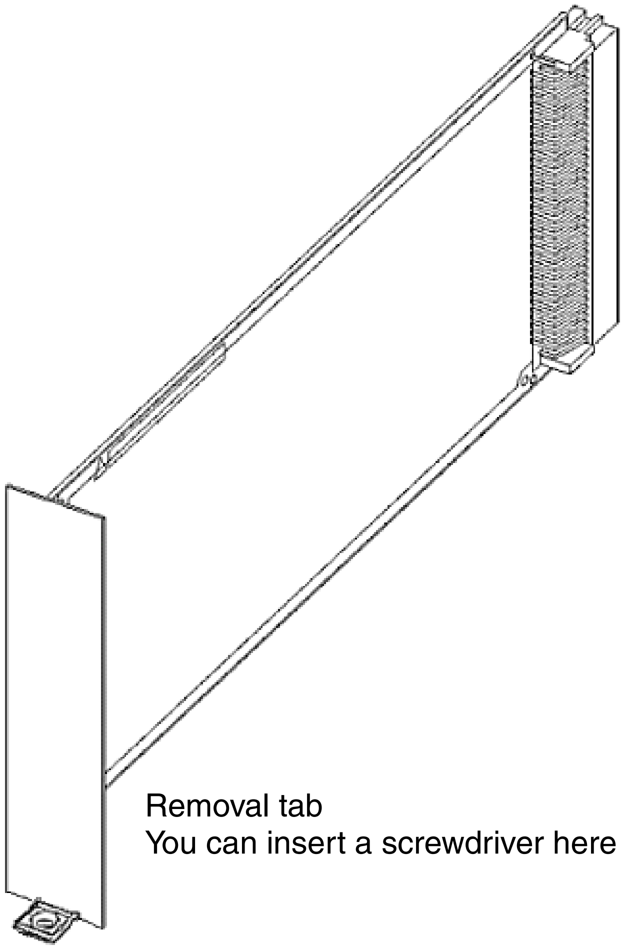
  – Operating voltage: + 5 V

  – Contact current: max. 1.25 A

  – Contact power: max. 30 W

All of the functions are controlled by the CBSAP board.

Two –48-V lines fused using a PTC resistor are available for external applications. Signals are picked up via MDFU-E (Table 3-164: M48VF1 / 0V_F and M48VF2 / 0V_F). Each trunk has a maximum load capacity of 300 mA.



To the SIPAC 4SU connector X17

Signals are picked up via SIVAPAC connector X116 on the backplane.

Removal tab
You can insert a screwdriver here to remove REALS from the shelf.

Figure 3-157 REALS (S30807-Q6629-X)

Slot

Insert the REALS board into the slot marked 3 in the lower part of the shelf in the basic cabinet and apply pressure until you hear a click (see Figure 4-21).

The slots for the power supply units and for the REALS board must be covered with an outer panel before the system is started up. The outer panel is fixed onto the shelf with screws (see Figure 3-158).

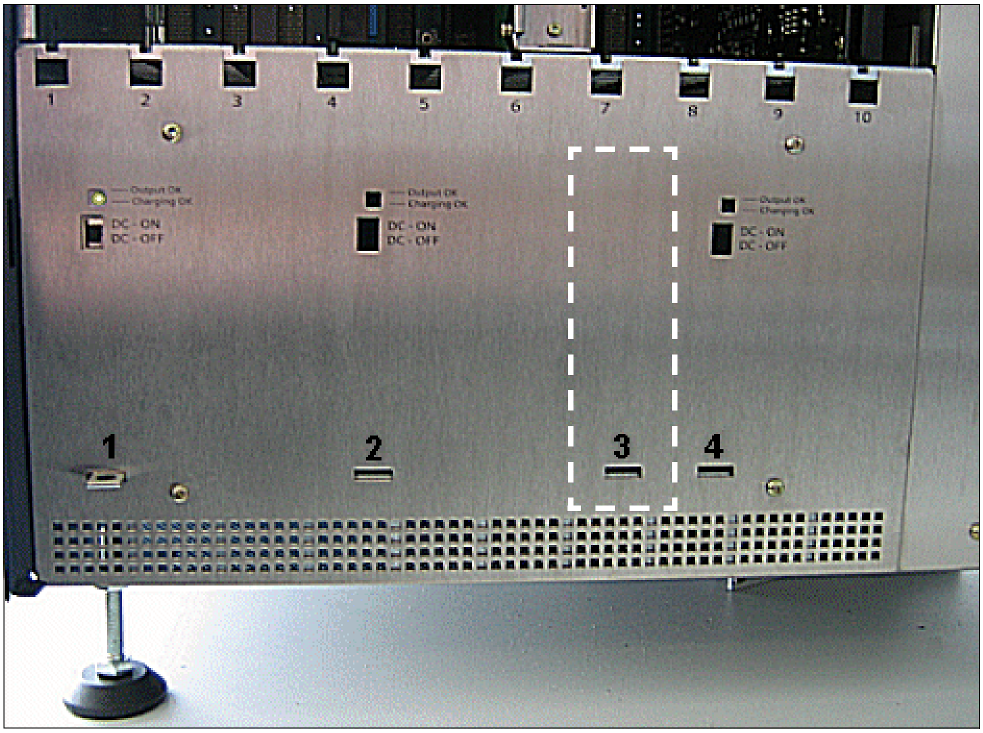


Figure 3-158 REALS Slots in the Basic Cabinet (With Outer Panel Mounted)

Cable and connector assignment

Table 3-164 shows the assignment of the SIVAPAC connector X116 on the backplane and the assignment of the jumper strip in the MDFU-E.

Table 3-164 REALS - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC Connector X116	REALS	MDFU-E	Notes
1	wht/blu		20	M48VF1	1a	– 48 V (max. 300 mA)
		blu/wht	38	0V_F	1b	
2	wht/ora		18	PFTTLB	2a	ALUM: Subscriber line (telephone)
		ora/wht	17	PFTTLA	2b	
3	wht/grn		16	0 V	3a	
		grn/wht	15	–	3b	
4	wht/brn		14	0V_F	4a	
		brn/wht	13	M48VF2	4b	– 48 V (max. 300 mA)
5	wht/gry		12	–	5a	
		gry/wht	11	0 V	5b	
6	red/blu		10	AK1	6a	
		blu/red	9	AK2	6b	
7	red/ora		8	AK3	7a	
		ora/red	7	AK4	7b	
8	red/grn		6	0 V	8a	
		grn/red	5	PFTASA	8b	ALUM: Trunk board
9	red/brn		4	PFTASB	9a	
		brn/red	3	PFTALA	9b	ALUM: Trunk
10	red/gry		2	PFTALB	10a	
		gry/red	1	–	10b	
11	blk/blu		37	–	11a	
		blu/blk	36	0 V	11b	
12	blk/ora		35	–	12a	
		ora/blk	34	–	12b	
13	blk/grn		32	RK3	13a	
		grn/blk	31	0 V	13b	
14	blk/brn		30	RK1	14a	
		brn/blk	29	RK2	14b	
15	blk/gry		27	RK4	15a	
		gry/blk	26	0 V	15b	
16	yel/blu		24	PFTTSB	16a	ALUM: Subscriber line module
		blu/yel	23	PFTTSA	16b	

Table 3-164 REALS - SIVAPAC Connector Assignment on the Backplane

Pair	a-Wire (Tip)	b-Wire (Ring)	SIVAPAC Connector X116	REALS	MDFU-E	Notes
17	yel/ora		58	–	17a	
		ora/yel	57	S5	17b	
18	yel/grn		56	0 V	18a	
		grn/yel	55	–	18b	
19	yel/brn		54	–	19a	
		brn/yel	53	S3	19b	
20	yel/gry		52	S4	20a	
		gry/yel	51	0 V	20b	
21	vio/blu		50	UK1	21a	
		blu/vio	49	UK2	21b	
22	vio/ora		48	UK3	22a	
		ora/vio	47	UK4	22b	
23	vio/grn		46	0 V	23a	
		grn/vio	45	–	23b	
24	vio/brn		44	–	24a	
		brn/vio	43	S6	24b	

3.4.15 STBG4 (For France Only)

Introduction

This current-limiting board is for connecting loop start trunks in France (HiPath 3550 and HiPath 3350). It includes the current-limiting components and surge-protection elements required by law.

No options bus lines are needed.

The slot X3 wiring is polarized.

The STBG4 channel is looped between TLA and the trunk.

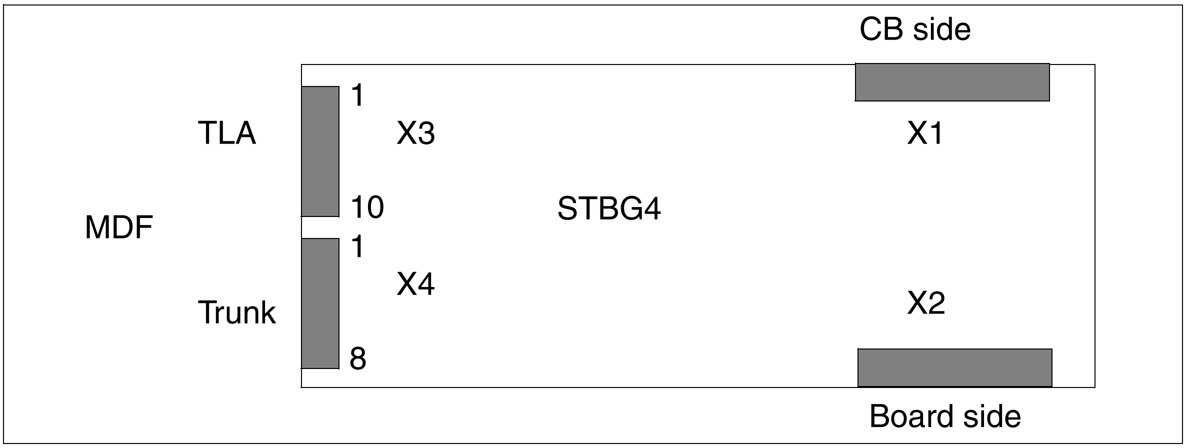


Figure 3-159 STBG4 (For France Only) - Interfaces (S30817-Q934-A)

Table 3-165 STBG4 (For France Only) - Contact Assignment

Contact	Connector X3	Connector X4
1	Not used	AL 1
2	BL 1	BL 1
3	AN 1	AL 2
4	BL 2	BL 2
5	AN 2	AL 3
6	BL 3	BL 3
7	AN 3	AL 4
8	BL 4	BL 4
9	AN 4	–
10	Not used	–

3.4.16 STRB, STRBR

Introduction

This option comes in two versions:

- STRB (**C**ontrol **R**elay **B**oard) S30817-Q932-A (Figure 3-160) - for use in HiPath 3550 and HiPath 3350 (wall housing)
- STRBR (**C**ontrol **R**elay **B**oard **R**ack) S30817-K932-Z (Figure 3-161) - for use in HiPath 3500 and HiPath 3300 (19-inch housing)

The STRB or STRBR has four double-pin, double-throw relays as shown in Figure 3-162).

Actuators and sensors for monitoring, alerting, controlling and regulating can be connected to the control relay board. Actuators are relays that can be energized from any station by means of a code (such as a door opener). Sensors (such as thermostats or motion detectors) can detect a change of status in the connected equipment and activate a feature or dial a station number stored in the system.

The board has a total of four outputs (in the form of two floating switch contacts each) and four control inputs in the form of optocouplers for externally activating an electrically isolated normally open (NO) contact.

> ⚠ **Caution**
> CDB data is stored on the board. When replacing the board, be sure to store the CDB data elsewhere. If a used board is used, old data may still be present on the board.
> Only factory technicians should use the "Reset options" procedure in expert mode (code 29-3-3). Using the procedure during operation returns all options to their factory defaults, and they must be reset before they can accept data again from the central board.

Example: You can route the +12-V signal for power failure alert to the control input of the optocoupler for connector X4 or X6. Route the signal through a normally open (NO) contact that is electrically isolated from the external device, then program the alert type. For safety, the control voltage for the optocoupler is electrically isolated from the system’s other partial voltages.

For the manual relay on/off function and door opener, you must enter the desired switching time (expert mode code 26 2).

STRB interfaces

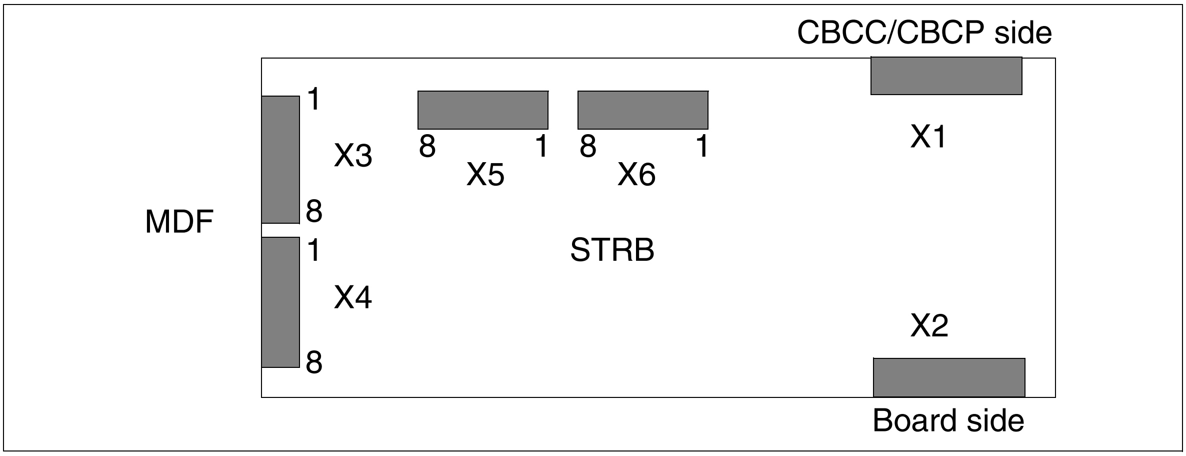

CBCC/CBCP side
1
X3
8
1
X4
8
MDF
8
1
X5
8
1
X6
STRB
X1
X2
Board side

Figure 3-160 STRB Interfaces (S30817-Q932-A)

STRBR interfaces

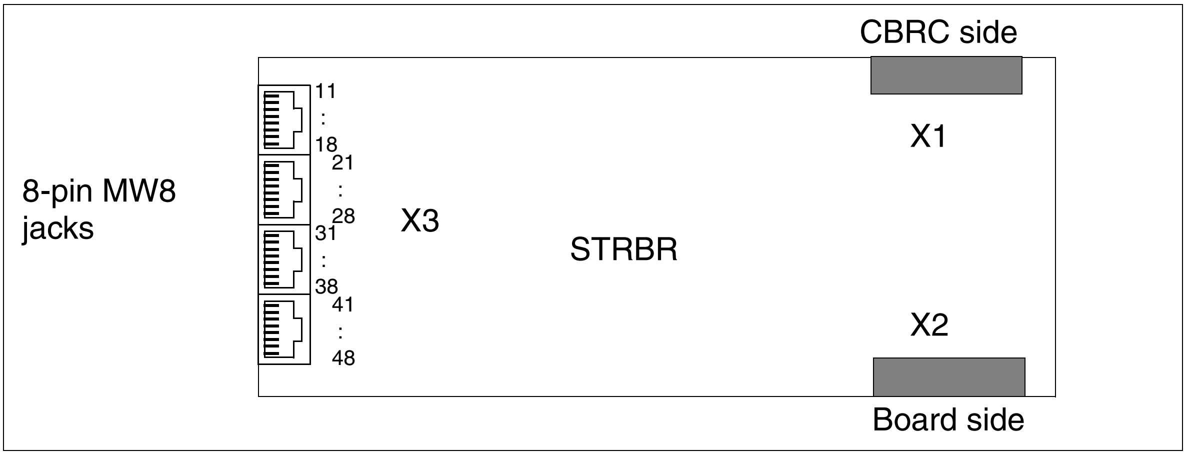

CBRC side
8-pin MW8 jacks
11
:
18
21
:
28
31
:
38
41
:
48
X3
STRBR
X1
X2
Board side

Figure 3-161 STRBR Interfaces (S30817-Q932-Z)

Control relay connection values

⚠ **Warning**
The STRB or STRBR interface is an SELV (**S**afety **E**xtra-**L**ow **V**oltage Circuit) interface, as defined by IEC 60950.
Do not connect any circuits whose voltages exceed the following limit values:
Maximum: 30 Vac (42 V_{peak}) or 60 Vdc.

STRB and STRBR board relay and sensor functions

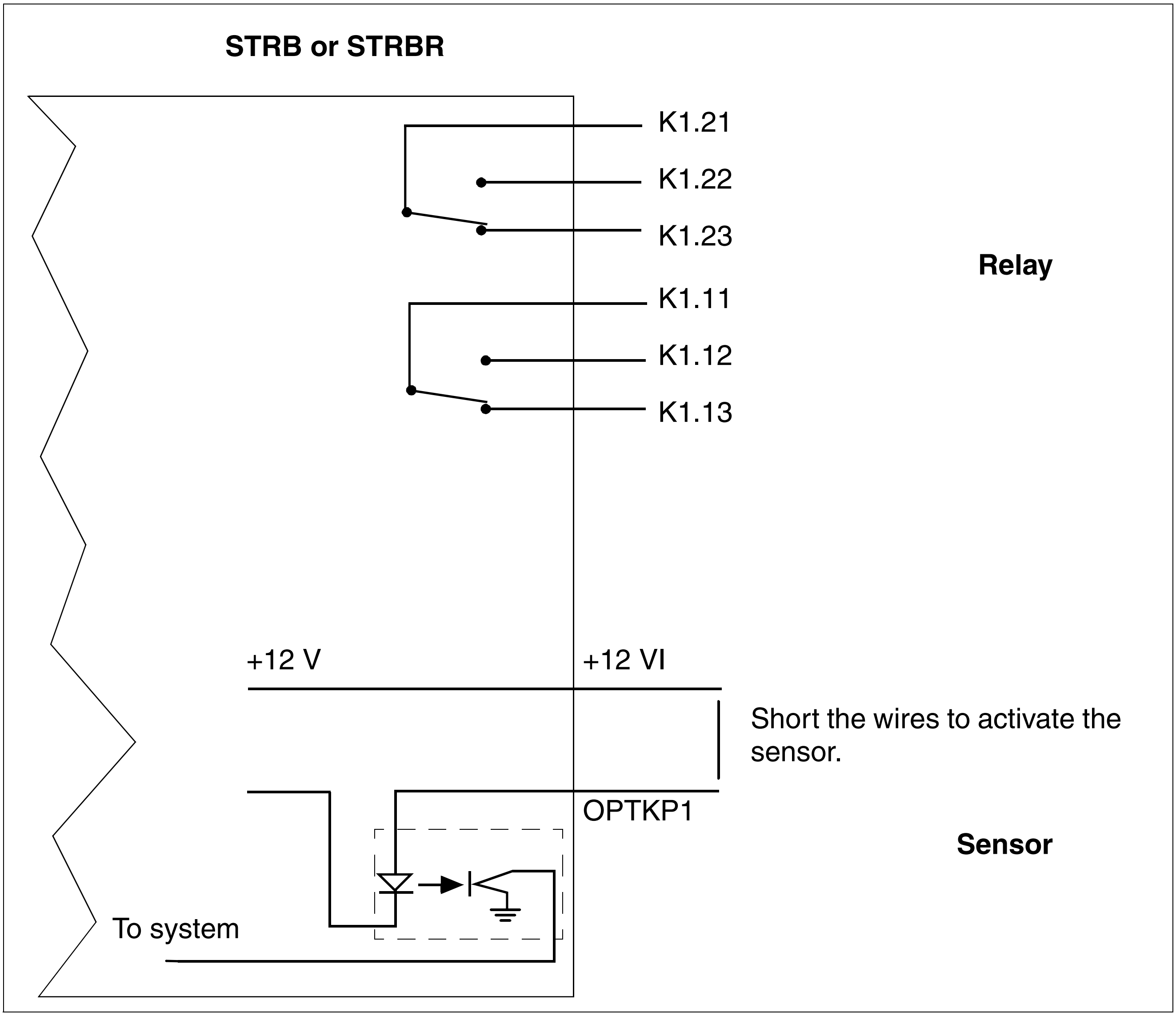

STRB or STRBR
K1.21
K1.22
K1.23
Relay
K1.11
K1.12
K1.13
+12 V
+12 VI
Short the wires to activate the sensor.
OPTKP1
Sensor
To system

Figure 3-162 STRB and STRBR Board Relay and Sensor Functions

STRB contact assignment

Table 3-166 STRB Contact Assignments

Connector	Contact	Signal Name	Function
X3	1	K 4.21	Relay contact K4.2 (common)
	2	K 4.22	Relay contact K4.2 (NO)
	3	K 4.23	Relay contact K4.2 (NC)
	4	K 3.21	Relay contact K3.2 (common)
	5	K 3.22	Relay contact K3.2 (NO)
	6	K 3.23	Relay contact K3.2 (NC)
	7	K 2.21	Relay contact K2.2 (common)
	8	K 2.22	Relay contact K2.2 (NO)
X4	1	K 2.23	Relay contact K2.2 (NC)
	2	K 1.21	Relay contact K1.2 (common)
	3	K 1.22	Relay contact K1.2 (NO)
	4	K 1.23	Relay contact K1.2 (NC)
	5	+12VI	+12-V control voltage optocoupler
	6	OPTKP 2	Control input optocoupler 2
	7	+12VI	+12-V control voltage optocoupler
	8	OPTKP 1	Control input optocoupler 1
X5	1	K 3.12	Relay contact K3.1 (NO)
	2	K 3.13	Relay contact K3.1 (NC)
	3	K 2.11	Relay contact K2.1 (common)
	4	K 2.12	Relay contact K2.1 (NO)
	5	K 2.13	Relay contact K2.1 (NC)
	6	K 1.11	Relay contact K1.1 (common)
	7	K 1.12	Relay contact K1.1 (NO)
	8	K 1.13	Relay contact K1.1 (NC)
X6	1	OPTKP 3	Control input optocoupler 3
	2	+12VI	+12-V control voltage optocoupler
	3	OPTKP 4	Control input optocoupler 4
	4	+12VI	+12-V control voltage optocoupler
	5	K 4.11	Relay contact K4.1 (common)
	6	K 4.12	Relay contact K4.1 (NO)
	7	K 4.13	Relay contact K4.1 (NC)
	8	K 3.11	Relay contact K3.1 (common)

STRBR contact assignments

Table 3-167 STRBR Contact Assignments

X3, pin	Signal Name	Function
11	ACT4-2M	Relay contact K203 (common) 2
12	ACT4-2B	Relay contact K203 (NO) 2
13	ACT4-2A	Relay contact K203 (NC) 2
14	ACT4-1M	Relay contact K203 (common) 1
15	ACT4-1B	Relay contact K203 (NO) 1
16	ACT4-1A	Relay contact K203 (NC) 1
17	P12VI	+ 12-V optocoupler 4
18	SENSE4	Control input optocoupler 4
21	ACT3-2M	Relay contact K202 (common) 2
22	ACT3-2B	Relay contact K202 (NO) 2
23	ACT3-2A	Relay contact K202 (NC) 2
24	ACT3-1M	Relay contact K202 (common) 1
25	ACT3-1B	Relay contact K202 (NO) 1
26	ACT3-1A	Relay contact K202 (NC) 1
27	P12VI	+ 12-V optocoupler 3
28	SENSE3	Control input optocoupler 3
31	ACT2-2M	Relay contact K201 (common) 2
32	ACT2-2B	Relay contact K201 (NO) 2
33	ACT2-2A	Relay contact K201 (NC) 2
34	ACT2-1M	Relay contact K201 (common) 1
35	ACT2-1B	Relay contact K201 (NO) 1
36	ACT2-1A	Relay contact K201 (NC) 1
37	P12VI	+ 12-V optocoupler 2
38	SENSE2	Control input optocoupler 2
41	ACT1-2M	Relay contact K200 (common) 2
42	ACT1-2B	Relay contact K200 (NO) 2
43	ACT1-2A	Relay contact K200 (NC) 2
44	ACT1-1M	Relay contact K200 (common) 1
45	ACT1-1B	Relay contact K200 (NO) 1
46	ACT1-1A	Relay contact K200 (NC) 1
47	P12VI	+ 12-V optocoupler 1
48	SENSE1	Control input optocoupler 1

3.4.17 V24/1 (not for U.S.)

Introduction

You can use the V24/1 board in HiPath 3550 and HiPath 3350. This provides a serial V.24 interface for connecting PCs, printers or applications.

Interfaces

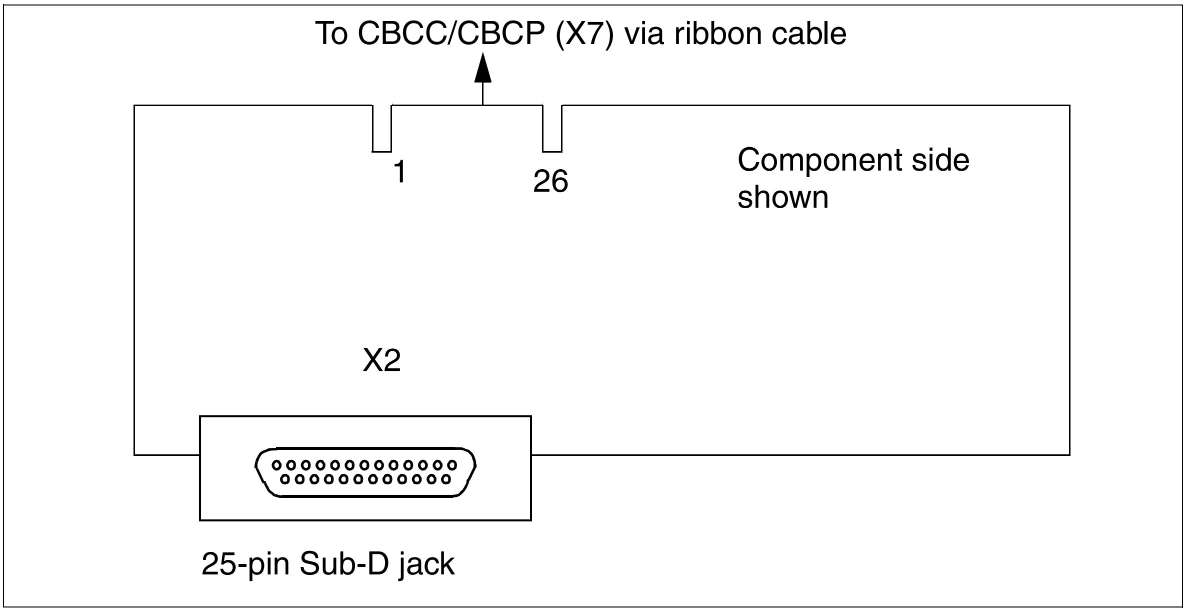

To CBCC/CBCP (X7) via ribbon cable
1
26
Component side shown
X2
25-pin Sub-D jack

Figure 3-163 V24/1 (Not for U.S.) (S30807-Q6916-X100)

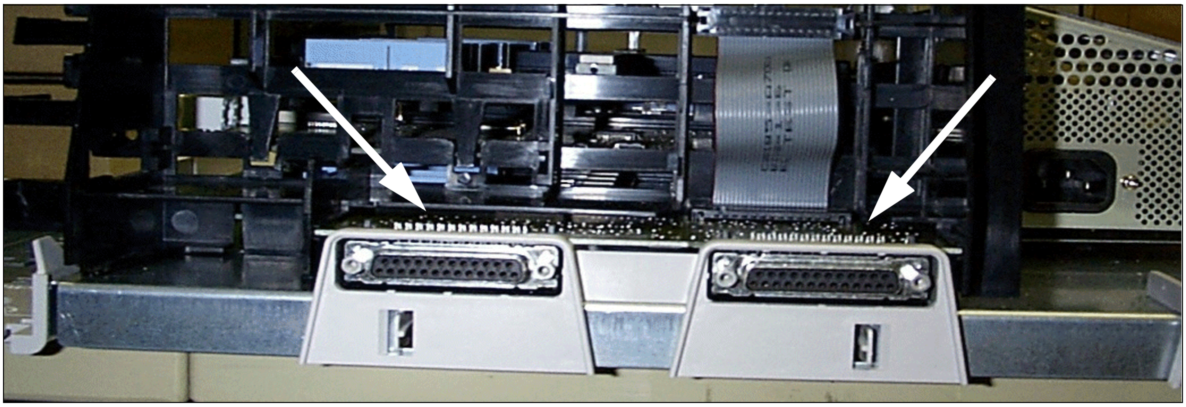


Figure 3-164 HiPath 3550 and HiPath 3350 - V.24 Connections

Connector assignment

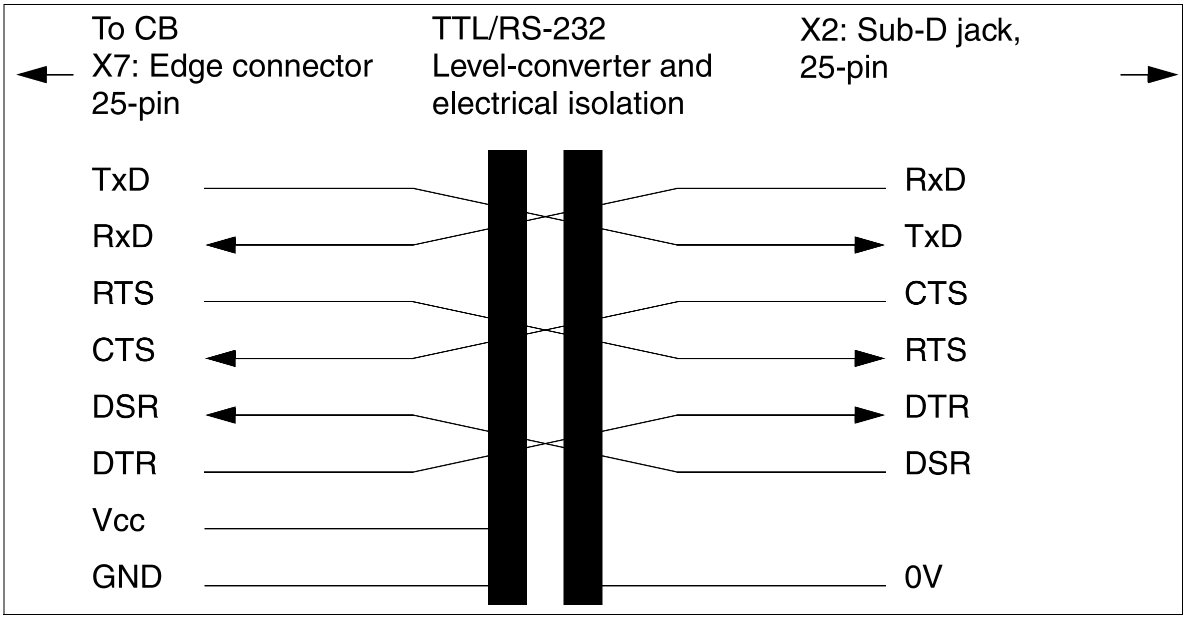

To CB
X7: Edge connector
25-pin
TTL/RS-232
Level-converter and
electrical isolation
X2: Sub-D jack,
25-pin
TxD
RxD
RTS
CTS
DSR
DTR
Vcc
GND
RxD
TxD
CTS
RTS
DTR
DSR
0V

Figure 3-165 V.24 (RS-232) Connector Assignment, HiPath 3550 and HiPath 3350

Table 3-168 Pin Assignments of the V.24 Socket X2

Connector X2	Signal	I/O
2	TxD	O
3	RxD	I
4	RTS	O
5	CTS	I
6	DSR	I
20	DTR	O
7	0V	12000 - 12100
No other pins in connector X2 are used.		

3.4.18 V.24 Adapter

The V.24 adapter is required as an adapter between the 25-pin connector on the cable (C39195-Z7267-C13) and a 9-pin jack for connection to the V.24 interface on all HiPath 3000 V1.2 (or later) systems.

V.24 adapter assignment

Table 3-169 V.24 Adapter Assignment (C39334-Z7080-C2)

9-pin jack	Signal	25-pin jack
Pin		**Pin**
1	DCD	8
2	RxD	3
3	TxD	2
4	DTR	20
5	GND	7
6	DSR	6
7	RTS	4
8	CTS	5
9	RI	22

3.4.19 V.24 Cable

The V.24 cable is used, for example, for connecting a service PC to the V.24 interface on all HiPath 3000 systems (V1.2 or later).

V.24 cable assignment

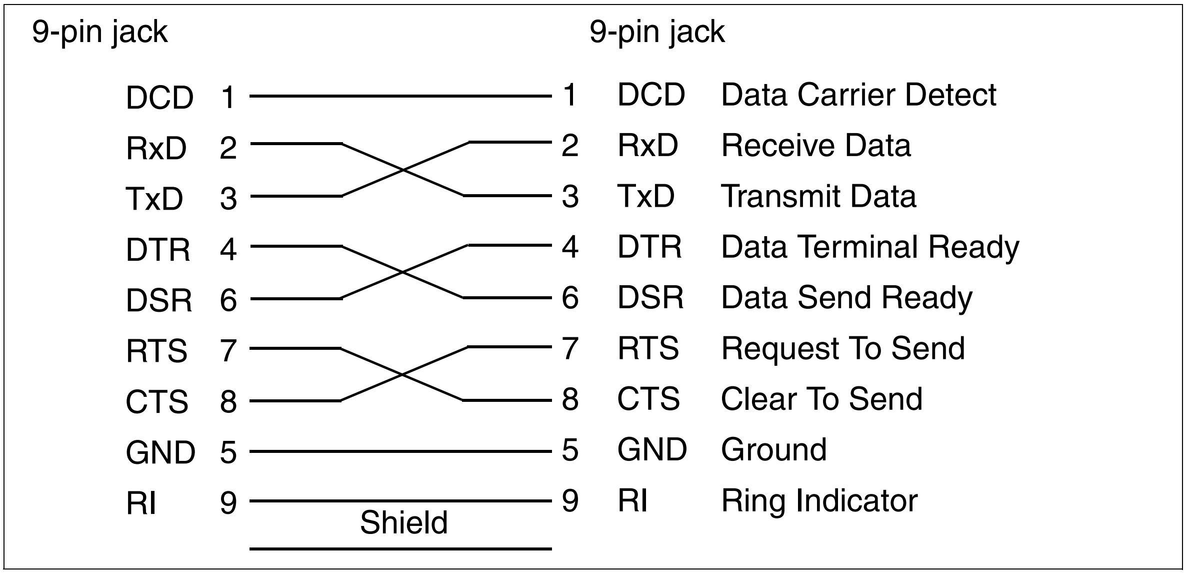

9-pin jack
9-pin jack
DCD 1
RxD 2
TxD 3
DTR 4
DSR 6
RTS 7
CTS 8
GND 5
RI 9
Shield
1 DCD Data Carrier Detect
2 RxD Receive Data
3 TxD Transmit Data
4 DTR Data Terminal Ready
6 DSR Data Send Ready
7 RTS Request To Send
8 CTS Clear To Send
5 GND Ground
9 RI Ring Indicator

Figure 3-166 V.24 Cable Assignment (C30267-Z355-A25)

4 Installing HiPath 3000

4.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Installing HiPath 3800, page 4-3
● Installation Prerequisites, page 4-3
● Installation Procedure, page 4-4
● Installing HiPath 3800 (Standalone), page 4-5
● Installing HiPath 3800 (19-Inch Cabinet), page 4-21
● Installing Boards (Configuration Notes), page 4-31
● Connecting the Cable to the Backplane, page 4-49
● Using an External Main Distribution Frame or External Patch Panel, page 4-64
● Loading the System Software and Installing Subboards on the CBSAP, page 4-79
● Connecting Workpoint Clients, page 4-80
● Making Trunk and Networking Connections, page 4-80
● Performing a Visual Inspection, page 4-81
Installing HiPath 3750, HiPath 3700, page 4-83
● Installation Prerequisites, page 4-83
● Installation Procedure, page 4-84
● Installing HiPath 3750, page 4-86
● Installing HiPath 3700 (19-Inch Cabinet), page 4-127
● Loading the System Software and Installing Subboards on the CBCPR, page 4-151
● Configuration notes, page 4-152
● Connecting Workpoint Clients, page 4-161
● Making trunk connections, page 4-161
● Performing a Visual Inspection, page 4-162
Installing HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300, page 4-163
● Installation Prerequisites, page 4-163
● Installation Procedure, page 4-164

Topic
- Installing HiPath 3550 and HiPath 3350, page 4-165
- Installing HiPath 3500 and HiPath 3300 (19-Inch Housing), page 4-186

4.2 Installing HiPath 3800

4.2.1 Installation Prerequisites

⚠ **Warning**
Only authorized service personnel should install and start up the system.

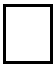
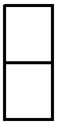
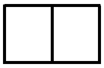
Tools and resources needed

The following are needed for installing the HiPath 3800 system:

- **Tools**:
  - Hex or open-end wrench, 8 mm, open-end wrench 13 mm
  - Diagonal cutting pliers, telephone pliers, wire stripper, flat-nosed pliers
  - Slotted screwdrivers, from 2 to 8 mm (1/4 to 5/16 in.)
  - Phillips or cross-point screwdrivers, sizes 1 and 2
  - TORX screwdriver
  - Wire stripper (for example, from Krone)
  - Board wrench (part no. C39300-A7194-B10)
  - Electric drill, hammer
  - Level, tape measure
  - For U.S. only: Punch-down tool suitable for the block used (such as block 66)
- **Resources**:
  - Assistant T or HiPath 3000 Manager E
  - Digital multimeter for testing ground connections and partial voltages
  - Telephone test set for analog interfaces
  - Not for U.S.: ISDN tester (such as K3000 or Aurora)
  - For U.S. only: Aurora$^{\text{Duet}}$, Aurora$^{\text{Expert,}}$ Aurora$^{\text{Remote}}$ or similar, ISDN protocol analyzer

4.2.2 Installation Procedure

Table 4-1 HiPath 3800 - Installation Procedure

Step	Installation Activity	
	Installing HiPath 3800 (Standalone)	**Installing HiPath 3800 (19-Inch Cabinet)**
1.	Selecting the Installation Site, page 4-5 (usually predetermined)	Selecting the Installation Site, page 4-21 (generally determined by the existing 19-inch cabinet)
2.	Unpacking the Components, page 4-7	Unpacking the Components, page 4-24
3.	Setting up the System Cabinets (from Page 4-8): Single Cabinet  Two cabinets (stacked)  Two cabinets (side by side) 	Mounting System Cabinets in the 19-Inch Cabinet, page 4-25
4.	Grounding the System, page 4-15 Checking the Grounding, page 4-20	Grounding the System, page 4-28 Checking the Grounding, page 4-30
5.	Installing Boards (Configuration Notes), page 4-31	
6.	Connecting the Cable to the Backplane, page 4-49	
7.	If required: use an external main distribution frame or external patch panel, from Page 4-64: ● Main Distribution Frame MDFU-E ● Patch Panel S30807-K6143-X ● S_0 Patch Panel C39104-Z7001-B3	
8.	Loading the System Software and Installing Subboards on the CBSAP, page 4-79	
9.	Connecting Workpoint Clients, page 4-80	
10.	Making Trunk and Networking Connections, page 4-80	
11.	Performing a Visual Inspection, page 4-81	

4.2.3 Installing HiPath 3800 (Standalone)

This section contains information on how to install the HiPath 3800 communication system. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment or expansions.

4.2.3.1 Selecting the Installation Site

Selecting a site

The customer usually has a preferred installation site in mind.

Make sure that the customer's site meets the following guidelines:

- To guarantee sufficient system ventilation, allow a minimum of 50 mm clearance between the base of the cabinet and the ground and between stacked cabinets.
- When cabinets are stacked, the basic cabinet must always be at the bottom of the stack.
- Allow a minimum clearance of 10 cm both at the rear and the front of the cabinets for maintaining boards and for wiring.
- Do not expose the systems to direct sources of heat (for example sunlight and heaters).
- Do not expose the systems to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.9.

For U.S. Only:

- Install secondary-protection equipment.
- Avoid standard carpeting, as it tends to produce electrostatic charges.
- Ensure the availability of a power source that meets the requirements described in Section 4.2.3.1.1.
- Ensure that Siemens equipment is 40 in. (101.6 cm) from other electrical equipment. The National Electrical Code (NEC) requires 36 in. (91.44 cm) of clearance in front of electrical equipment and 40 in. (101.6 cm) of clearance from other electrical service equipment.

Information on the design of the HiPath 3800 can be found in Section 2.2.2.1.

4.2.3.1.1 For U.S. only: AC outlet

An AC connection is required for each cabinet. The AC connection must fulfill the requirements specified in Table 4-2.

Table 4-2 Electrical Connection Values (USA only)

Nominal voltage	**Nominal voltage range**		**Nominal Frequency Range**		**Wall Outlet Configurations**
	from	**to**	**from**	**to**	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

⚠ **WARNING**
Never connect a HiPath 3800 system or a combination of HiPath 3800 systems directly to a wall socket. Use a UL-listed or CSA-certified surge protector for every two cabinets.

AC Power Outlet Requirements

- A UL-listed or CSA-certified surge protector must be connected between the socket and the system. Two cabinets can be connected to each surge protector. Never connect a HiPath 3800 system or a combination of systems directly to a wall socket.
- The power source may not be more than 2.4 m (8 ft.) from the system.
- The power source must provide 120 V AC (single-phase, fused) power at 50-60 Hz and 20 A.
- A warning should be attached to the circuit breaker to prevent accidental removal of power.
- An independent electric circuit with an isolated ground conductor should be used.

The system must be properly grounded before startup (see description in Section 4.2.3.4).

4.2.3.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.

⚠ **Caution**
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.2.3.3 Setting up the System Cabinets

Introduction

The cabinets are not supplied with pre-installed boards. For information on board installation, please see Section 4.2.5, “Installing Boards (Configuration Notes)”.

If it has been agreed to provide connector panels for connecting peripherals, these are included in the delivery. For information on the installation procedure, please see Section 4.2.5.3, “Mounting Connector Panels (if required)”.

The front plastic cover (for board servicing) and the rear plastic cover (for cable servicing) are not attached to the system cabinets. Both covers are supplied in separate packages.

> ⚠ **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before starting the system and before connecting up the peripherals (for example, potential equalization bus). The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

4.2.3.3.1 Overview

System configurations

The following setup options are possible for system cabinets:

- Single cabinet
- Two cabinets (stacked)
- Two cabinets (side by side)

4.2.3.3.2 Setting Up a Single Cabinet

⚠ **Caution**
To guarantee sufficient ventilation for the system cabinet, allow a minimum clearance of 50 mm between the base of the cabinet and the ground.

Procedure

Step	Activity
1.	Place the system cabinet in the installation site and make sure that it is level and stable.
2.	Check that the space between the base of the cabinet and the ground is at least 50 mm.
3.	If necessary, set up the basic cabinet in the following way: ● Unscrew lock nut (Figure 4-1, A) on one of the cabinet feet using an open-end wrench (wrench size = 13 mm). ● Adjust the height of the cabinet foot by turning the screw nut (Figure 4-1, B) so that the cabinet is steady and the minimum clearance is observed. ● Fix the cabinet foot in position by tightening the lock nut (Figure 4-1, A).

Basic cabinet setup

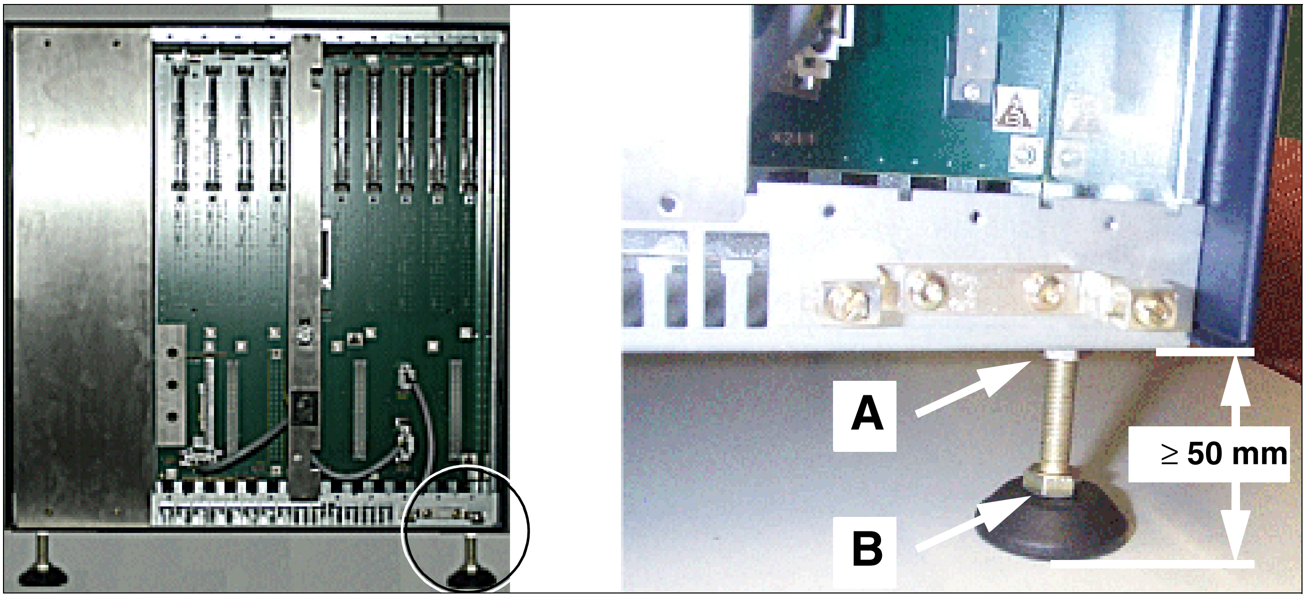


Figure 4-1 HiPath 3800 - Setting Up the Basic Cabinet

4.2.3.3.3 Stacking Two Cabinets

⚠ **Caution**
To guarantee sufficient ventilation for the system cabinets, comply with the following requirements:

- The basic cabinet must be set up as the bottom cabinet.
- Allow a minimum of 50 mm clearance between the base of the cabinet and the floor, and between basic and expansion cabinets.

Procedure

Step	Activity
1.	Place the system cabinet in the installation site and make sure that it is level and stable.
2.	Check that the space between the base of the basic cabinet and the ground is at least 50 mm.
3.	If necessary, set up the basic cabinet in the following way: ● Unscrew lock nut (Figure 4-1, A) on one of the cabinet feet using an open-end wrench (wrench size = 13 mm). ● Adjust the height of the cabinet foot by turning the screw nut (Figure 4-1, B) so that the cabinet is steady and the minimum clearance is observed. ● Fix the cabinet foot in position by tightening the lock nut (Figure 4-1, A).
4.	Place the expansion cabinet on top of the basic cabinet. The cabinet feet have indents. When placing the expansion cabinet on top of the basic cabinet, ensure that these indents are sitting precisely on top of the screw heads in the four corners of the basic cabinet (Figure 4-2).
5.	Check that the space between the base of the basic cabinet and the ground is at least 50 mm.
6.	If necessary, set up the expansion cabinet as described in Step 3.

Positioning the cabinet feet

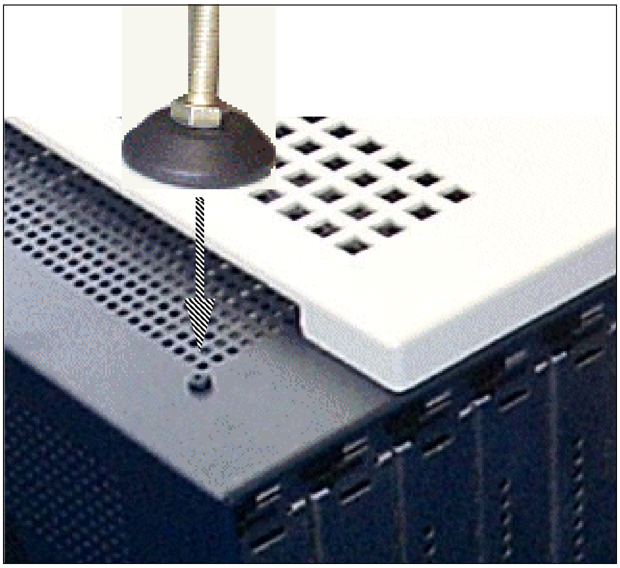


Figure 4-2 HiPath 3800 - Positioning the Cabinet Feet

Installing a stacked two-cabinet system

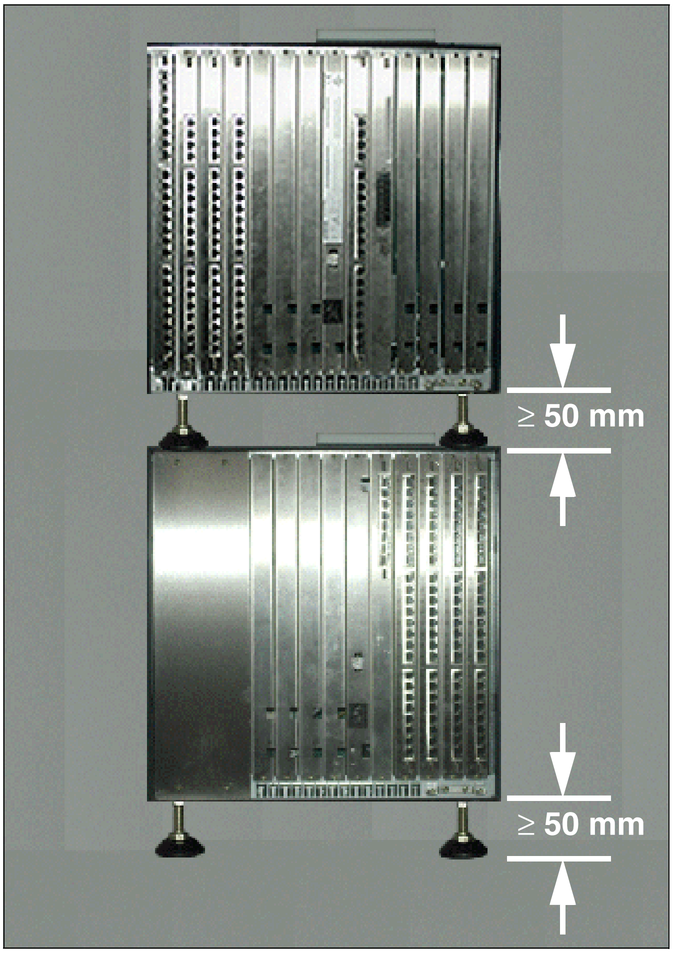


Figure 4-3 HiPath 3800 - Installing a Stacked Two-Cabinet System (Rear View)

4.2.3.3.4 Setting Up a Two-Cabinet System Side by Side

⚠ **Caution**
To guarantee sufficient ventilation in the system cabinets, allow a minimum clearance of 50 mm between the base of the cabinets and the ground.

Procedure

Step	Activity
1.	Place the system cabinet in the installation site and make sure that it is level and stable.
2.	Check that the space between the base of the basic cabinet and the ground is at least 50 mm.
3.	If necessary, set up the basic cabinet in the following way: ● Unscrew lock nut (Figure 4-1, A) on one of the cabinet feet using an open-end wrench (wrench size = 13 mm). ● Adjust the height of the cabinet foot by turning the screw nut (Figure 4-1, B) so that the cabinet is steady and the minimum clearance is observed. ● Fix the cabinet foot in position by tightening the lock nut (Figure 4-1, A).
4.	Place the expansion cabinet beside the basic cabinet. Note: The cabinets can be placed directly beside one another.
5.	Check that the space between the base of the expansion cabinet and the ground is at least 50 mm.
6.	If necessary, set up the expansion cabinet as described in Step 3 ensuring that both cabinets are at exactly the same level.

Installing a Two-Cabinet System Side by Side

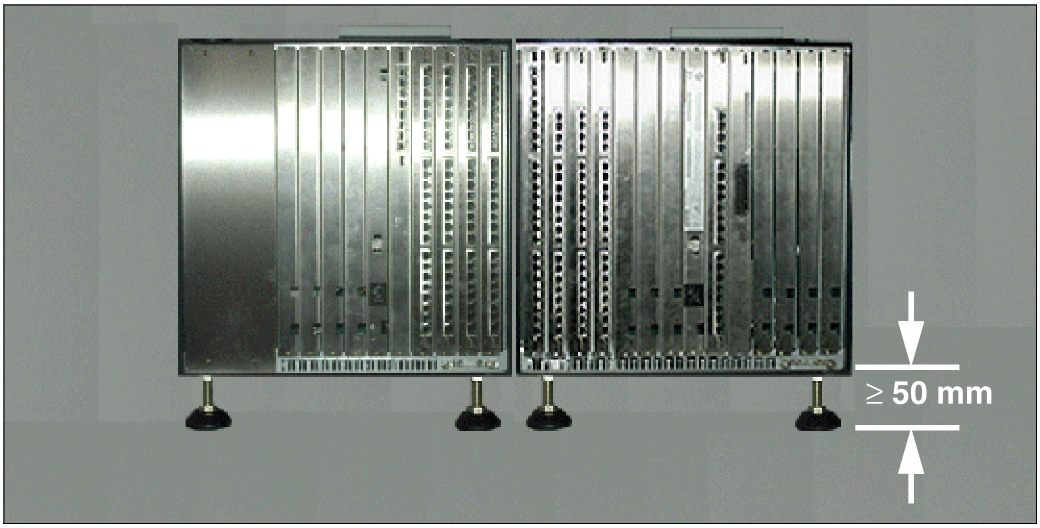


Figure 4-4 HiPath 3800 - Installing a Two-Cabinet System Side by Side (Rear View)

4.2.3.4 Grounding the System

Ground the system as described.

4.2.3.4.1 Not for U.S.: Grounding the System

Grounding: Grounding options

> **Danger**
> Each HiPath 3800 system cabinet and all external main distribution frames (for example, MDFU-E) must be grounded as shown in Figure 4-5 by a separate ground conductor (minimum cross-section = 2.5 mm^2). Make sure that the ground conductor is securely installed and strain-relieved.
> If external factors can impact on the ground conductor and if protected installation is not possible, the ground conductor must have a minimum cross-section of 4 mm^2.
> Failure to follow these instructions can result in electrical shock.

The illustrations starting with Figure 4-6 show different grounding options.

> **Danger**
> If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to ground the system separately using option 1b (Figure 4-7).

Note on possible ground loops

> To avoid ground loops from remotely operated devices (V.24 system peripherals), the devices should be connected to the same low-voltage network (sub-distribution board) if possible.
> If the building floor plan does not permit this, you may need a line driver to isolate the external devices in the event of a malfunction.

Grounding the system(s) and a possible main distribution frame

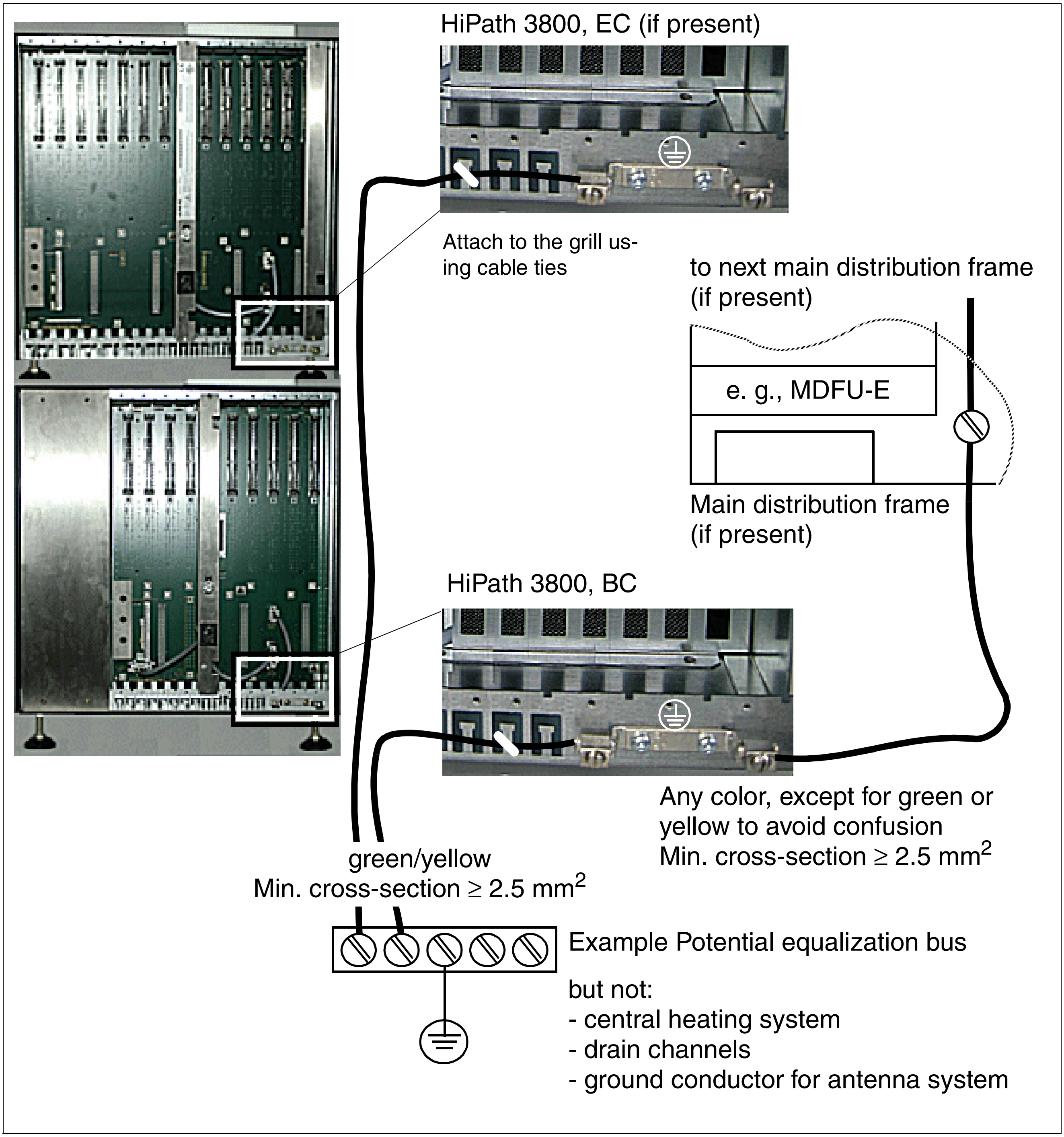

HiPath 3800, EC (if present)
Attach to the grill using cable ties
to next main distribution frame (if present)
e. g., MDFU-E
Main distribution frame (if present)
HiPath 3800, BC
Any color, except for green or yellow to avoid confusion
Min. cross-section ≥ 2.5 mm²
green/yellow
Min. cross-section ≥ 2.5 mm²
Example Potential equalization bus
but not:
- central heating system
- drain channels
- ground conductor for antenna system

Figure 4-5 HiPath 3800 - Grounding the System Cabinets and Main Distribution Frame (nor for U.S.)

Grounding option 1a

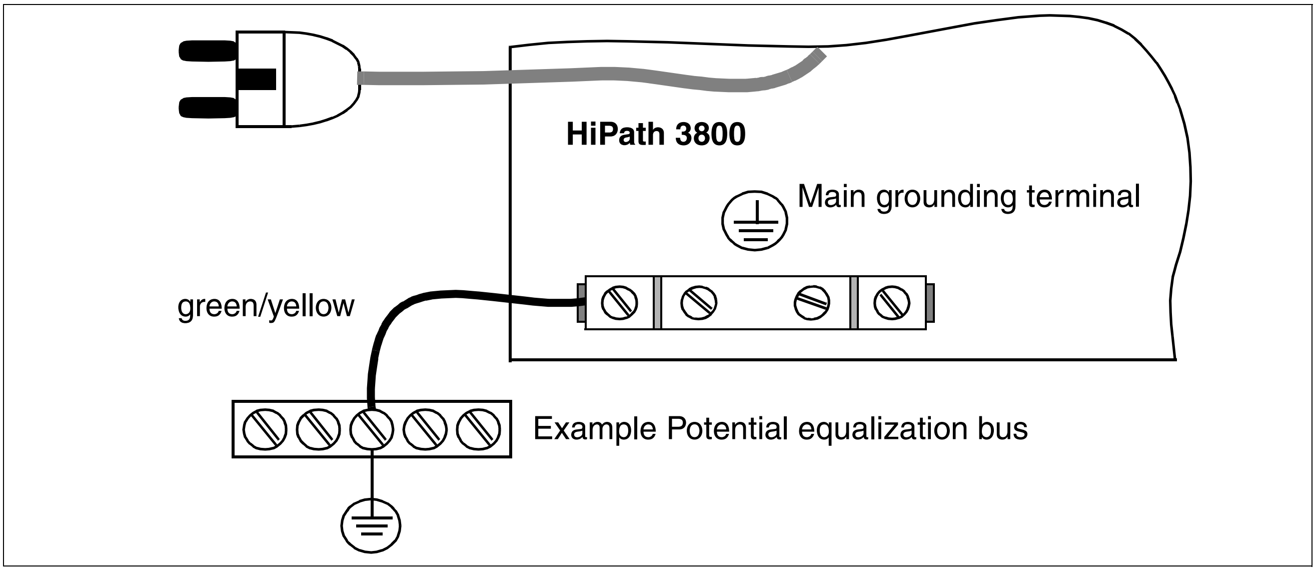

HiPath 3800
Main grounding terminal
green/yellow
Example Potential equalization bus

Figure 4-6 HiPath 3800 - Grounding Option 1a (not for USA)

Grounding option 1b

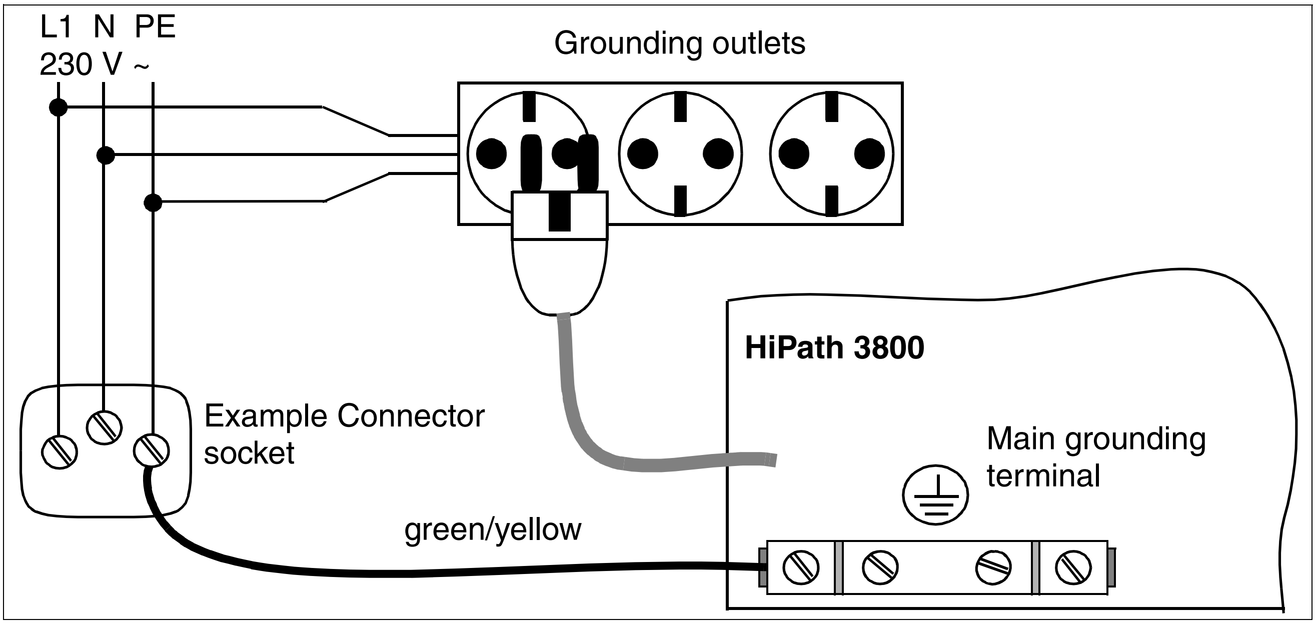

L1 N PE
230 V ~
Grounding outlets
HiPath 3800
Example Connector socket
Main grounding terminal
green/yellow

Figure 4-7 HiPath 3800 - Grounding Option 1b (not for USA)

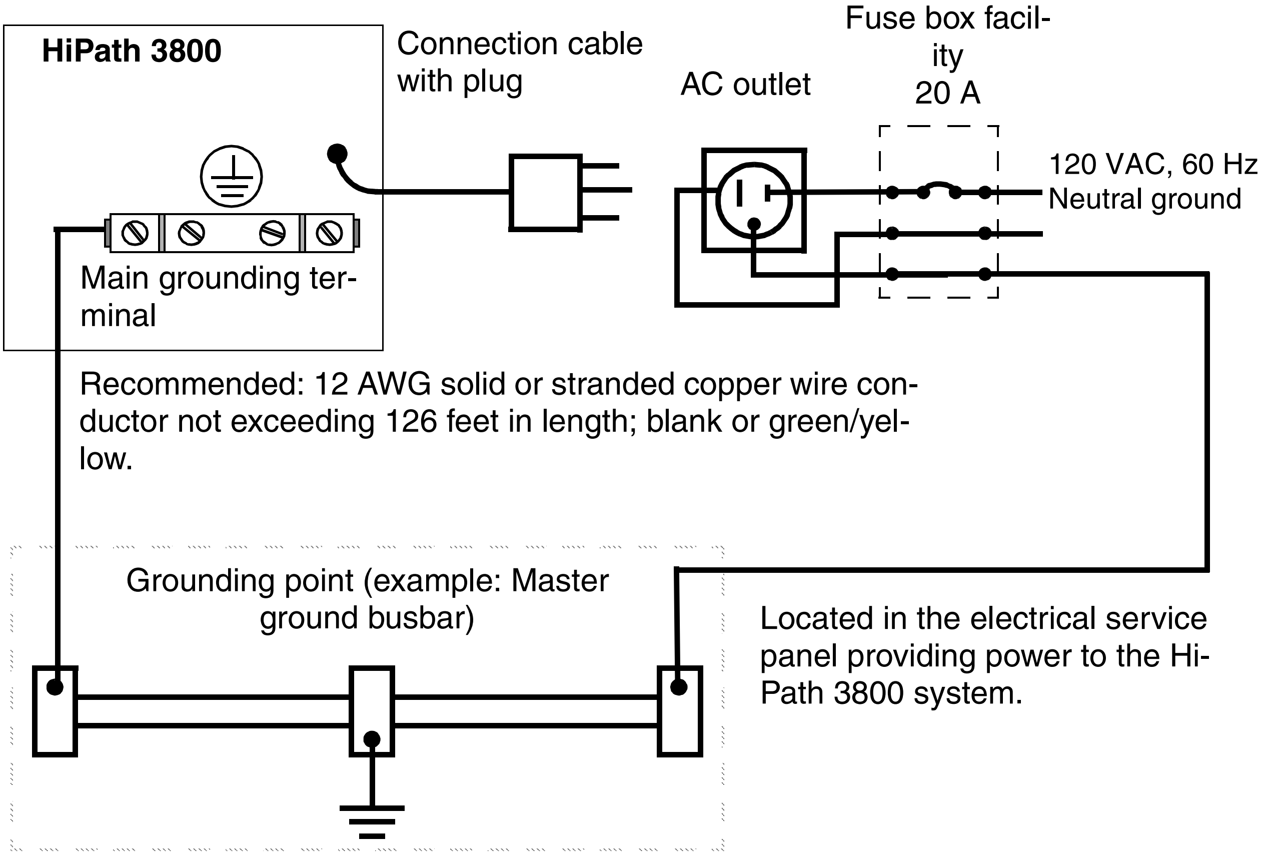
4.2.3.4.2 For U.S. Only: Grounding the System

A connecting cable is used for grounding the system cabinets. The system must also be grounded by a separate ground conductor. Choose a ground connection with less than 2 ohms of resistance, such as:

- Master ground busbar
- Ground field
- Copper ground rod

Run a separate earth ground conductor from the earth ground to the cabinet frame ground (located in the lower right corner of the backplane). The minimum cross-section required is 12 AWG.

Figure 4-8 shows the safety conductor connectors for the basic cabinet. An expansion cabinet requires a separate earth ground.


HiPath 3800
Connection cable with plug
AC outlet
Fuse box facility 20 A
120 VAC, 60 Hz
Neutral ground
Main grounding terminal
Grounding point (example: Master ground busbar)

Recommended: 12 AWG solid or stranded copper wire conductor not exceeding 126 feet in length; blank or green/yellow.

Located in the electrical service panel providing power to the HiPath 3800 system.

Notes: Single-point ground (SPG) configuration shown.

DANGER
This wire installation must be completed by a qualified electrician and must comply with the national and local electrical codes.

Figure 4-8 HiPath 3800 - Earth ground connection (for U.S. only)

Grounding the Main Distribution Frame

Mount and ground the MDF in accordance with the manufacturer’s instructions.

4.2.3.5 Checking the Grounding

Procedure

Perform the tests in the table below to ensure that the system is properly grounded before startup.

Step	Activity	Target
1.	Check the ohmic resistance of the ground connection to the system: Perform measurement between the PE (protective earth) on a socket in the internal installation (at the system's installation site) and HiPath 3800. Prerequisites: ● HiPath 3800 is not yet connected to the low-voltage network via the power cable. ● The system's separate grounding is connected.	< 10 ohms
2.	Check the ohmic resistance between the individual system parts (basic cabinet, expansion cabinet, main distribution frame). Prerequisite: HiPath 3800 is not yet connected to the low-voltage network via the power cable.	< 1 ohm

4.2.4 Installing HiPath 3800 (19-Inch Cabinet)

This section contains information on how to install the HiPath 3800 communication system in a 19-inch cabinet. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment or expansions.

4.2.4.1 Selecting the Installation Site

The installation site is generally determined by the 19-inch cabinet already installed.

The following specifications must be observed when selecting a location:

- The 19-inch cabinets provided for installing the HiPath 3800 components must have the following characteristics:
  - Components installed in the 19-inch cabinet must be accessible from both the front and the rear.
  - It should be possible to install 19-inch components both at the front and at the rear (≥ four vertical bars).
  - It is recommended that the width of the cabinet measure 700 to 800 mm; the depth at least 600 mm. Deeper cabinets (800 - 900 mm) make installation, cable servicing, and the installation of additional components in the rear of the cabinet much easier.
  - The support brackets required for installing the system cabinets must have a minimum ultimate load of 40 kg. The support brackets must be purchased from the relevant 19-inch cabinet supplier.
  - The system cabinets must be fixed to the cabinet bars using the angle brackets included in the delivery.
- One height unit (one height unit is approx. 1.7” = 43 mm) must be kept clear above the cabinet to accommodate the gray plastic cover (Figure 4-9) attached to the top of the system cabinets. Never remove this plastic cover.
- The following minimum clearance must be provided in order to ensure adequate ventilation of the system cabinets in the 19-inch cabinet (see Figure 4-10):
  - three height units between two stacked system cabinets.
  - one height unit above one system cabinet if a patch panel is being installed, for example.
- To guarantee sufficient heat dissipation, the basic cabinet must be mounted at the lowest position in a 19-inch cabinet. In a 19-inch cabinet with active (heat-emitting) components already installed, the lowest position must be cleared for installation of the basic cabinet. If inactive components (e.g. patch panel) are involved, the basic cabinet can also be installed above them.

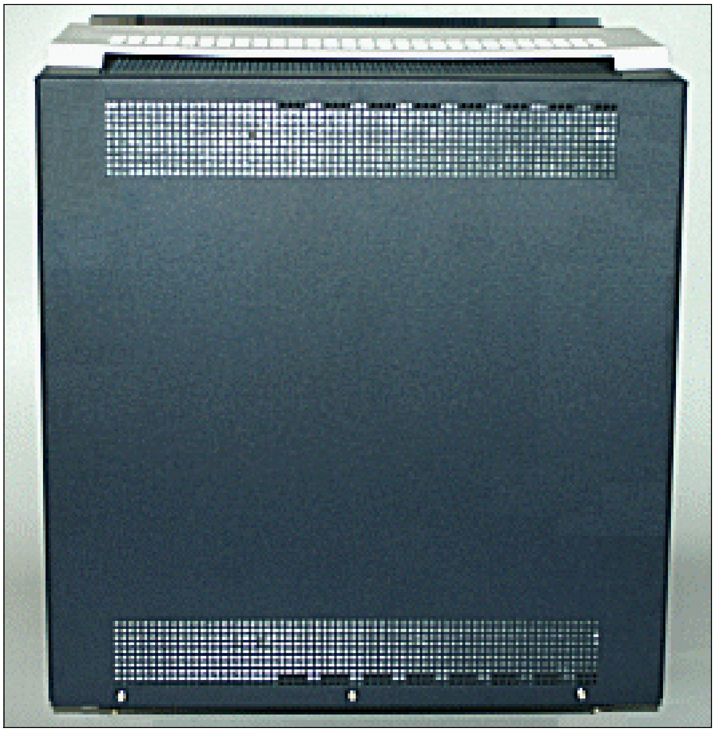


Figure 4-9 HiPath 3800 - System Cabinet with Plastic Cover

- Do not expose the 19-inch cabinet to direct sources of heat (such as sunlight and heaters.).
- Do not expose the 19-inch cabinet to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.9.

Information on the design of the HiPath 3800 can be found in Section 2.2.2.1.

Examples for installation in a 19-inch cabinet

Caution
The height units represented in yellow in Figure 4-10 must be kept clear to ensure adequate ventilation of the system cabinets.

Examples of a 19-inch cabinet height of 1.92 m with 37 height units

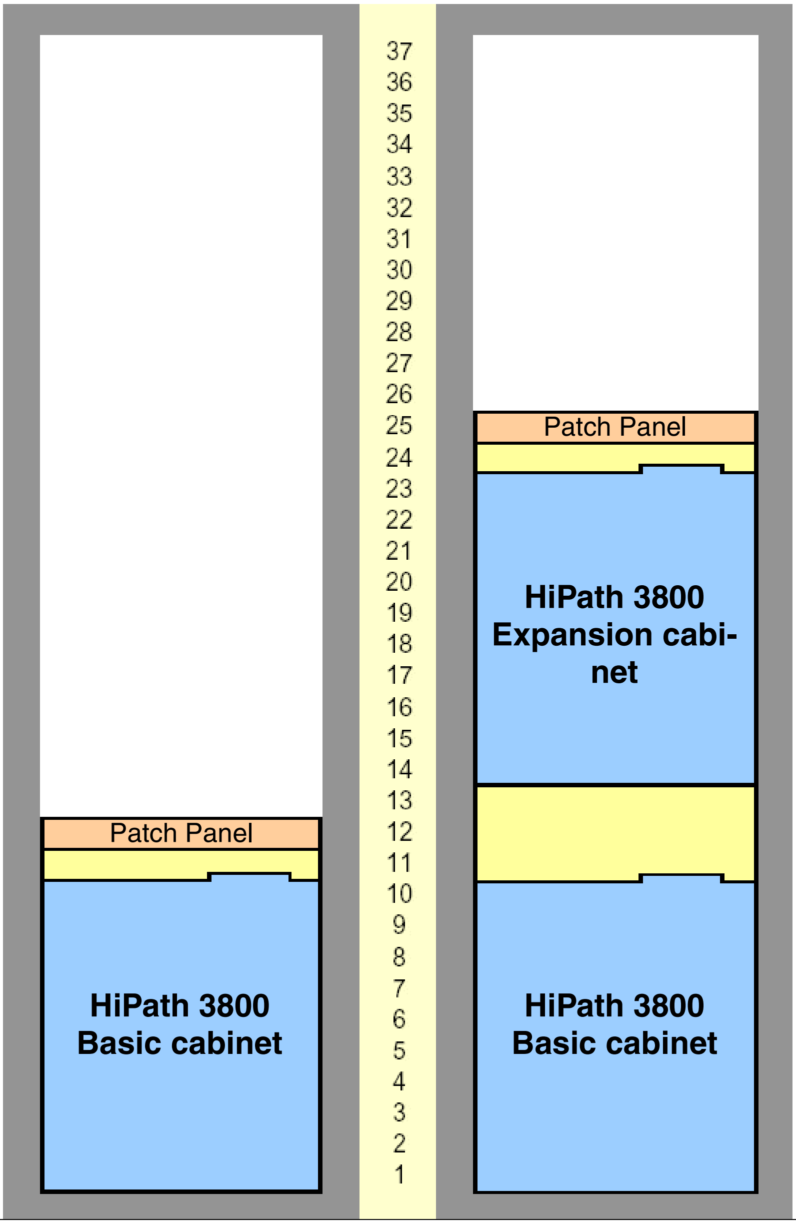

37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Patch Panel
HiPath 3800
Basic cabinet
Patch Panel
HiPath 3800
Expansion cabinet
HiPath 3800
Basic cabinet

Figure 4-10 HiPath 3800 - Installation Examples in the 19-Inch Cabinet

4.2.4.1.1 For U.S. only: AC outlet

An AC connection is required for each cabinet. The AC connection must fulfill the requirements specified in Table 4-3.

Table 4-3 Electrical Connection Values (USA only)

Nominal voltage	**Nominal voltage range**		**Nominal Frequency Range**		**Wall Outlet Configurations**
	from	**to**	**from**	**to**	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

The system must be properly grounded before startup (see description in Section 4.2.4.4).

4.2.4.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.

⚠ **Caution**
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.2.4.3 Mounting System Cabinets in the 19-Inch Cabinet

Introduction

The cabinets are not supplied with pre-installed boards. For information on board installation, please see Section 4.2.5, “Installing Boards (Configuration Notes)”.

If it has been agreed to provide connector panels for connecting peripherals, these are included in the delivery. For information on the installation procedure, please see Section 4.2.5.3, “Mounting Connector Panels (if required)”.

> ⚠ **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before starting the system and before connecting up the peripherals (for example, potential equalization bus).
> The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

4.2.4.3.1 Mounting a System Cabinet using Support and Angle Brackets

If a two-cabinet system is to be installed in a 19-inch cabinet, each system cabinet should be installed separately.

The following components are required to install a system cabinet:

- Two cabinet-specific support brackets with an ultimate load > 40 kg, which must be provided by the 19-inch cabinet supplier.
- Two angle brackets (order no. C39165-A7075-D1), which are supplied with the system cabinet.

> ⚠ **Caution**
> To guarantee sufficient ventilation for the system cabinets, comply with the following requirements:
> - The basic cabinet may only be mounted at the lowest position in a 19-inch cabinet. In a 19-inch cabinet with active (heat-emitting) components already installed, the lowest position must be cleared for installation of the basic cabinet. If inactive components (e.g. patch panel) are involved, the basic cabinet can also be installed above them.
> - A minimum clearance of three height units must be maintained between two stacked system cabinets. A minimum clearance of one free height unit above a system cabinet is sufficient if a patch panel is to be installed, for example.

Procedure

Warning
Never attempt to lift a system cabinet into the 19-inch cabinet without assistance.

Step	Activity
1.	Remove all four cabinet feet from the system cabinet. To do this, unscrew the lock nuts (Figure 4-11, A) on the cabinet feet using an open-end wrench (wrench size = 13 mm). Unscrew cabinet feet completely.
2.	Attach the two angle brackets (A in Figure 4-12) to the sides of the system cabinet using the screws that have been supplied (four per bracket).
3.	Attach a right-handed and a left-handed support bracket (B in Figure 4-12) in the 19-inch cabinet using the screws provided. Note: the use of cabinet floors is not permitted to prevent overheating.
4.	Lift the system cabinet into the 19-inch cabinet and sit the cabinet on the two support brackets (B in Figure 4-12). Slide the cabinet into the 19-inch cabinet until the front edge of the system cabinet is flush with the front of the 19-inch frame.
5.	Secure the system cabinet using the two angle brackets (A, in Figure 4-12) on the frame of the 19-inch cabinet using the screws provided. Please note that a minimum clearance of three height units must be observed between two stacked system cabinets. A minimum clearance of one free height unit above a system cabinet is sufficient if a patch panel is to be installed, for example.
6.	Repeat steps 1 to 5 if you want to install an expansion cabinet.

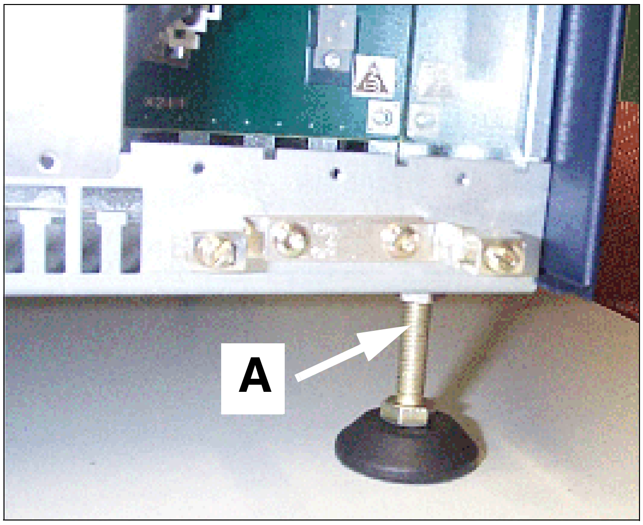


Figure 4-11 HiPath 3800 - Removing Cabinet Feet

Installation in the 19-inch cabinet

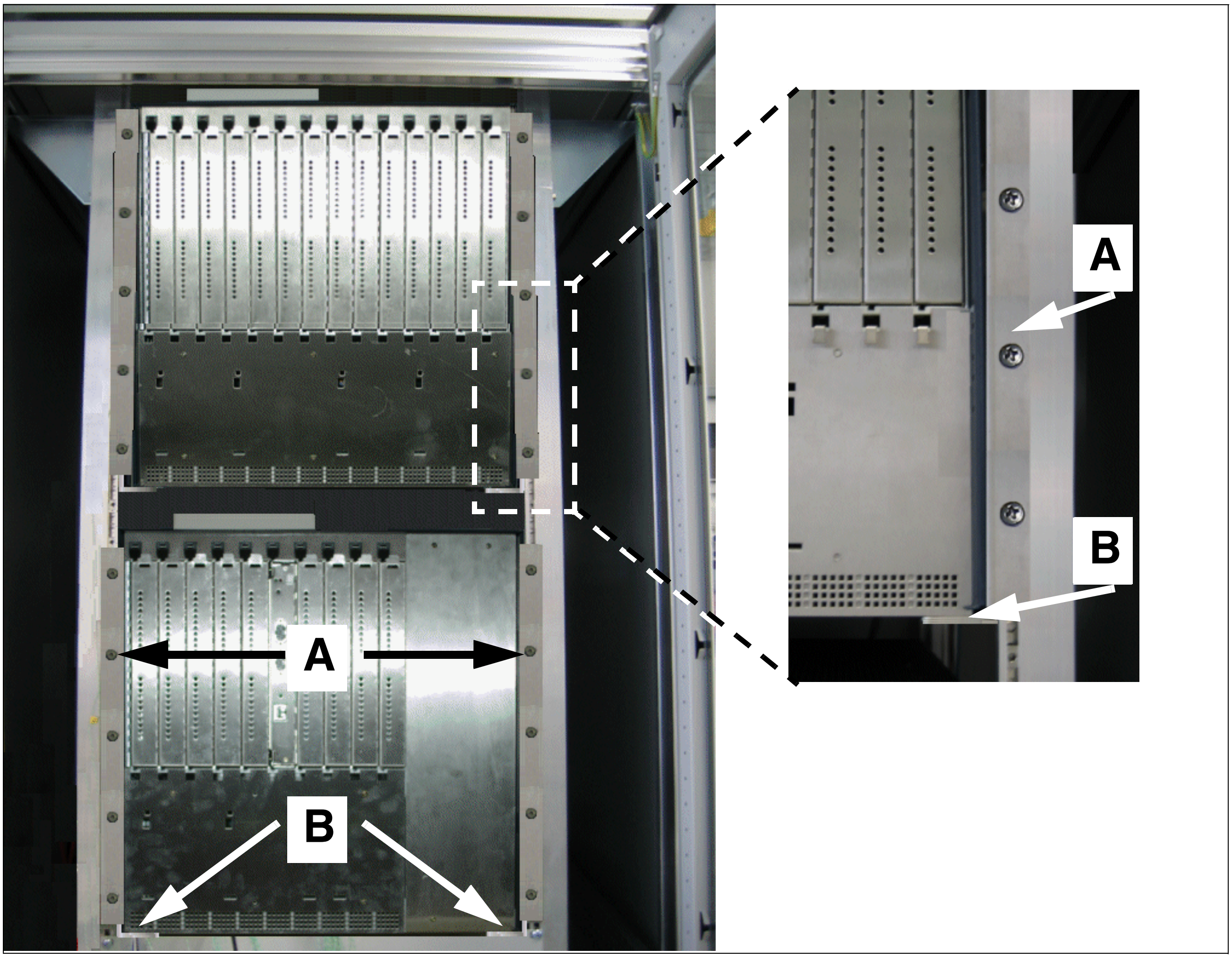


Figure 4-12 HiPath 3800 - Installing System Cabinets in 19-Inch Cabinet

4.2.4.4 Grounding the System

Ground the system as described.

Grounding: Inspection and Implementation

Preliminary Inspection of the 19-Inch Cabinet:		
Is the 19-inch cabinet grounded by a separate **ground conductor** (green/yellow)?	**NO** ▶	The 19-inch cabinet must be grounded by a separate ground conductor (green/yellow). **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground.
YES ▼		
Does the 19-inch cabinet have a **potential equalization bus** at which the HiPath 3800 can be grounded as shown in Figure 4-13 ?	**NO** ▶	A potential equalization bus must be installed in the 19-inch cabinet and connected to the ground conductor. **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground.
YES ▼		
If you answer “Yes” to both questions, the system (system cabinets, patch panels) may be grounded as described below.		

⚠ **Danger**
Each HiPath 3800 system cabinet and any patch panel (S30807-K6143-X) that may be installed must be grounded as shown in Figure 4-13 by a separate ground conductor (minimum cross-section = 2.5 mm^2). Make sure that the ground conductor is securely installed and strain-relieved.
If external factors can impact on the ground conductor and if protected installation is not possible, the ground conductor must have a minimum cross-section of 4 mm^2.
Please note:
The 19-inch cabinet’s potential equalization bus may only be used if it is grounded by a separate ground conductor.
Failure to follow these instructions can result in electrical shock.

Grounding the system cabinets and possible patch panels

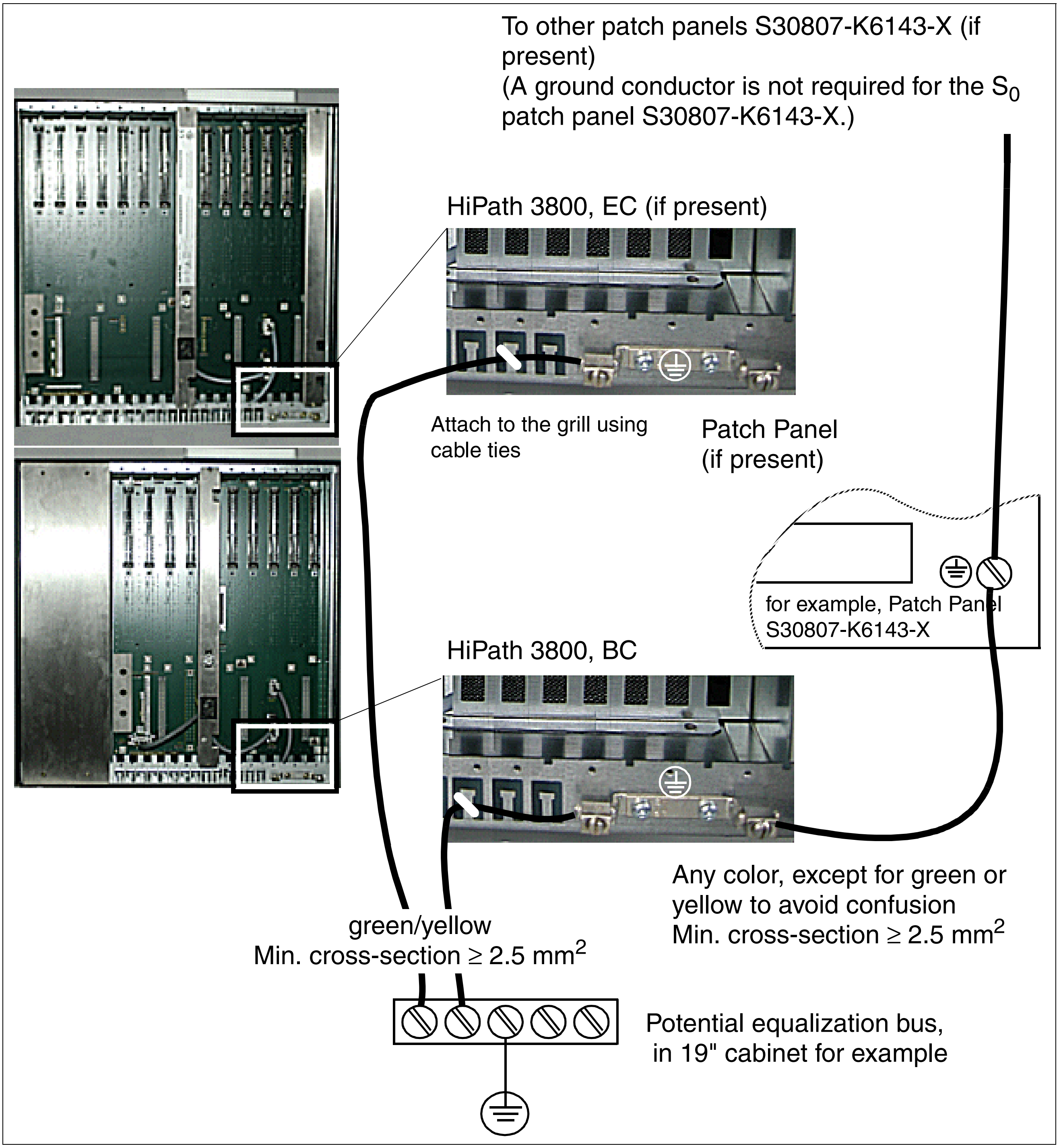

To other patch panels S30807-K6143-X (if present)
(A ground conductor is not required for the S_0 patch panel S30807-K6143-X.)
HiPath 3800, EC (if present)
Attach to the grill using cable ties
Patch Panel (if present)
for example, Patch Panel S30807-K6143-X
HiPath 3800, BC
Any color, except for green or yellow to avoid confusion
Min. cross-section ≥ 2.5 mm²
green/yellow
Min. cross-section ≥ 2.5 mm²
Potential equalization bus, in 19" cabinet for example

Figure 4-13 HiPath 3800- Grounding the Systems and Patch Panels in a 19-Inch Cabinet

Note on possible ground loops

> To avoid ground loops from remotely operated devices (V.24 system peripherals), the devices should be connected to the same low-voltage network (sub-distribution board) if possible.
> If the building floor plan does not permit this, you may need a line driver to isolate the external devices in the event of a malfunction.

4.2.4.5 Checking the Grounding

Procedure

Perform the tests in the table below to ensure that the system is properly grounded before startup.

Step	Activity	Target
1.	Check the ohmic resistance of the ground connection to the 19-inch cabinet: Perform measurement between the PE (protective earth) on a socket in the internal installation (at the system's installation site) and HiPath 3800. Prerequisites: ● No device in the 19-inch cabinet is connected to the low-voltage network via the power cable. ● The system's separate grounding (basic cabinet, expansion cabinet, patch panel) and the grounding of the 19-inch cabinet are connected.	< 10 ohms
2.	Check the ohmic resistance between the individual system parts (basic cabinet, expansion cabinet, patch panel). Prerequisite: HiPath 3800 is not yet connected to the low-voltage network via the power cable.	< 1 ohm

4.2.5 Installing Boards (Configuration Notes)

> **Caution**
> Always wear an antistatic wristband when working on the system (especially when handling boards).

Introduction

The cabinet(s) are not supplied with pre-installed boards. Install the boards as described in the following information.

> **Caution**
> - To ensure that the system operates without blocking, you must follow the instructions in Section 4.2.5.6 concerning PCM highway distribution.
> - For thermal reasons the IVMNL board may only be installed in the basic cabinet.

4.2.5.1 Board Slots in the Basic and Expansion Cabinet

There are nine slots available in the basic cabinet BC (slots 1 to 5 and slots 7 to 10) and thirteen in the expansion cabinet EC (slots 1 to 6 and slots 8 to 14) for peripheral boards.

The central control board CBSAP has a fixed slot (slot 6, only in the basic cabinet BC).

Depending on your requirements, up to three LUNA2 power supply units can be used in the basic cabinet BC and up to four in the expansion cabinet EC.

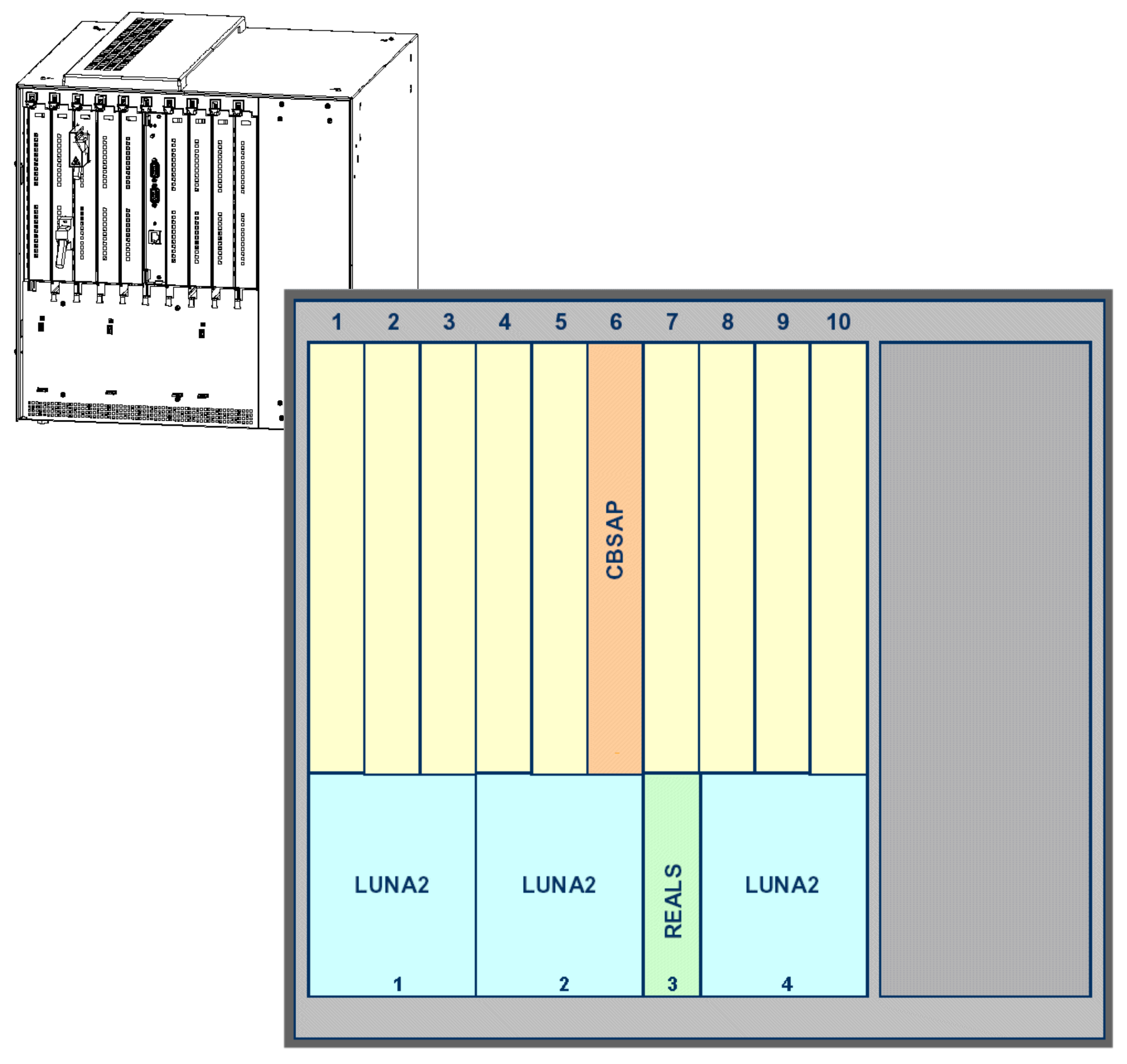

1
2
3
4
5
6
7
8
9
10
CBSAP
LUNA2
1
LUNA2
2
REALS
3
LUNA2
4

Figure 4-14 HiPath 3800 - Board Slots in the Basic Cabinet

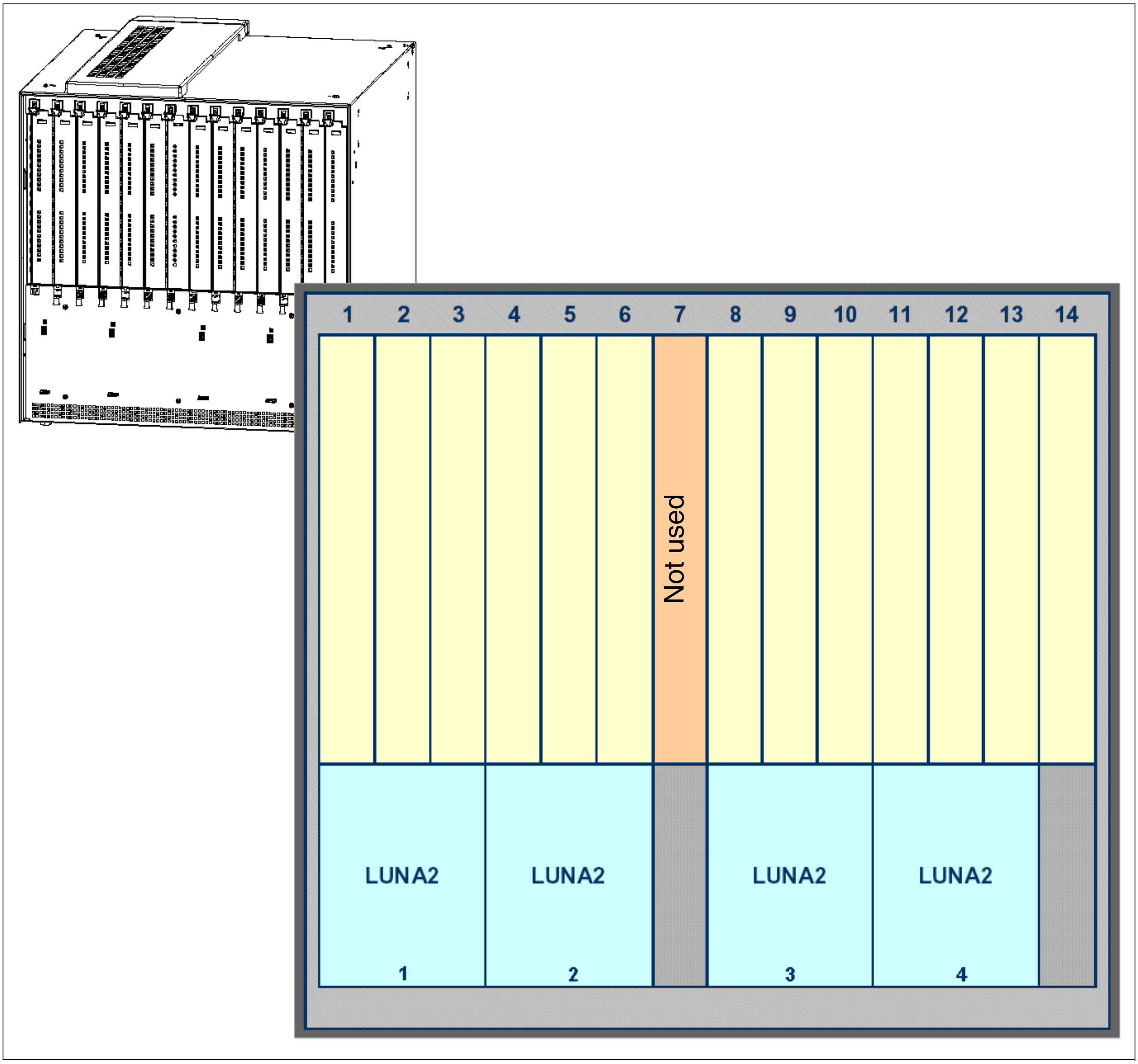

1
2
3
4
5
6
7
8
9
10
11
12
13
14
Not used
LUNA2
1
LUNA2
2
LUNA2
3
LUNA2
4

Figure 4-15 HiPath 3800 - Board Slots in the Expansion Cabinet

4.2.5.2 Inserting or Removing Boards

⚠ **Caution**
Always wear an antistatic wristband when working on the system (especially when handling boards).
Observe the measures for protecting electrostatically sensitive devices (see Page 1-9).

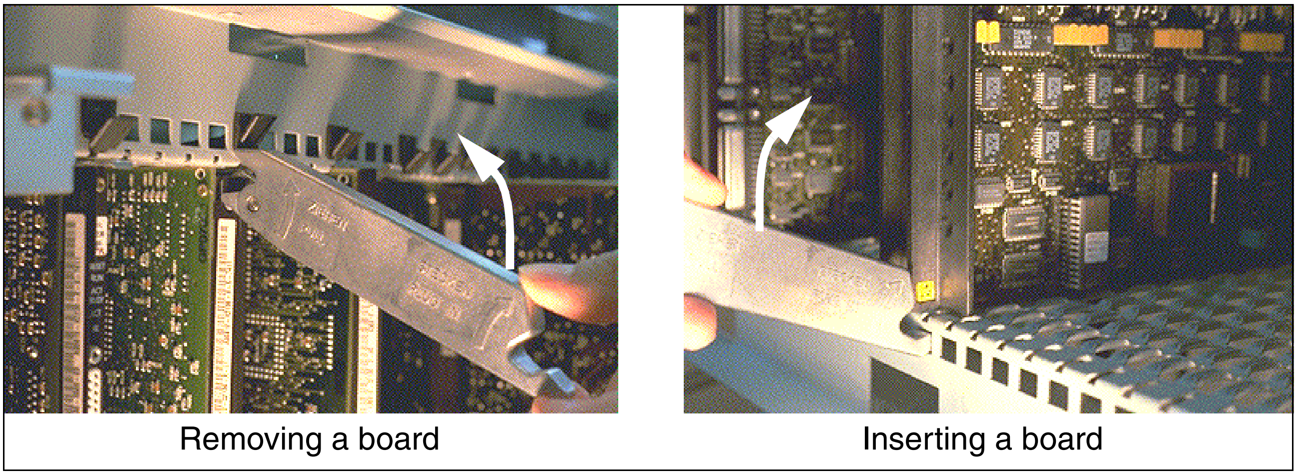
Introduction

Peripheral boards can be inserted and removed while the power is connected. Always use the board wrench provided for removing and inserting boards.

See Section 9.2.1 for information on upgrading peripheral boards.

Procedure for inserting and removing the boards

If	Then
Board is to be removed.	Insert the tip of the board wrench marked “Pull” into the top opening on the front cover of the board to be removed. Lever the board out of the shelf by pushing the board wrench upwards (Figure 4-16, left). Then you can pull the module out of the system cabinet over the guide rails.
Board is to be added.	Using its guide rails slide the board into the system cabinet until it stops. Insert the tip of the board wrench marked “Plug In” into the bottom opening in the front cover of the board. Lever the board into the shelf of the cabinet by pushing the board wrench upwards (Figure 4-16, right).


Removing a board

Inserting a board

Figure 4-16 HiPath 3800 - Removing/Inserting the Board Using the Board Wrench

Installing shielding covers

In order to guarantee adequate shielding, a shielding cover (C39165-A7075-B15) must be installed for boards with no connection options in the front panel. To do this, insert the two bottom pins on the shielding cover into the openings provided for this purpose on the slide-in shelf. Then push the shielding cover in the direction of the board until it locks into position (refer to Figure 4-17).

Empty board slots must also be covered with shielding covers.

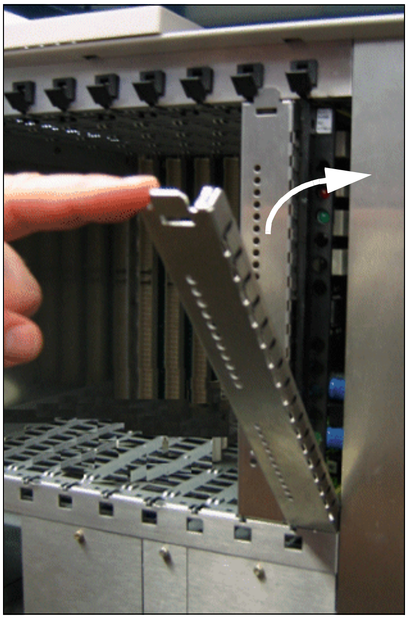


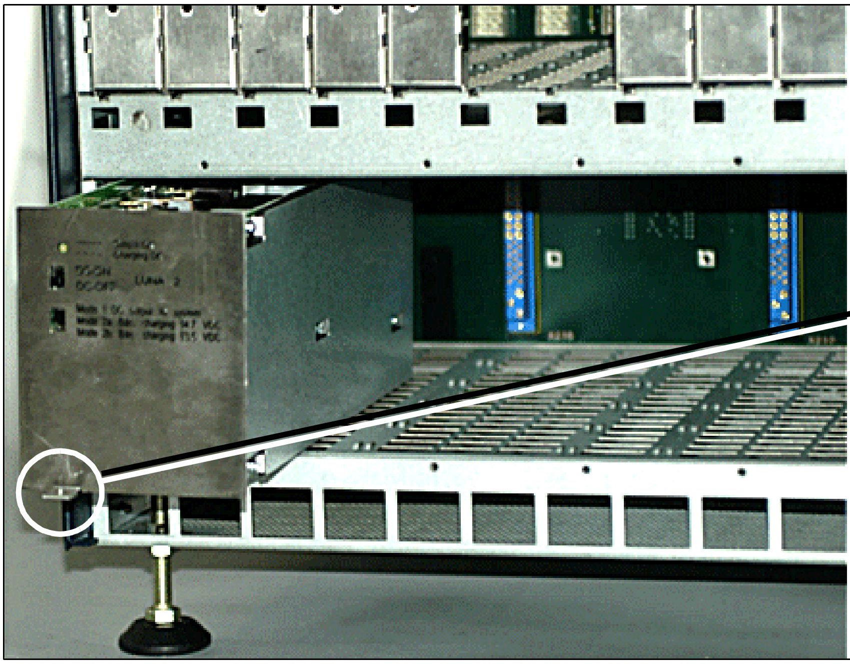
Figure 4-17 Installing the Board Shielding Cover

Boards that can be connected from the front have a specially shielded front cover. An additional cover is not required.

Special board attachments

- DBSAP
  The DBSAP board is plugged into four socket contacts on the backplane of the expansion cabinet and fixed with screws.
- LUNA2
  Depending on the system configuration up to three LUNA2 modules can be used in the basic cabinet and up to four LUNA2 modules can be used in the expansion cabinet. For information on how to calculate the number of LUNA2 modules required, see the LUNA2 board description.

  Push the LUNA2 power supply unit into the slots provided in the lower part of the system cabinet shelf until you hear a click.



Removal tab
You can use a screwdriver here to remove the LUNA2 from the shelf.

Figure 4-18 HiPath 3800 - Installing the LUNA2 Power Supply Unit

The slots for the power supply units must be covered with an outer panel before the system is started up. The outer panel is fixed onto the shelf with screws (see Figure 4-19 and Figure 4-20).

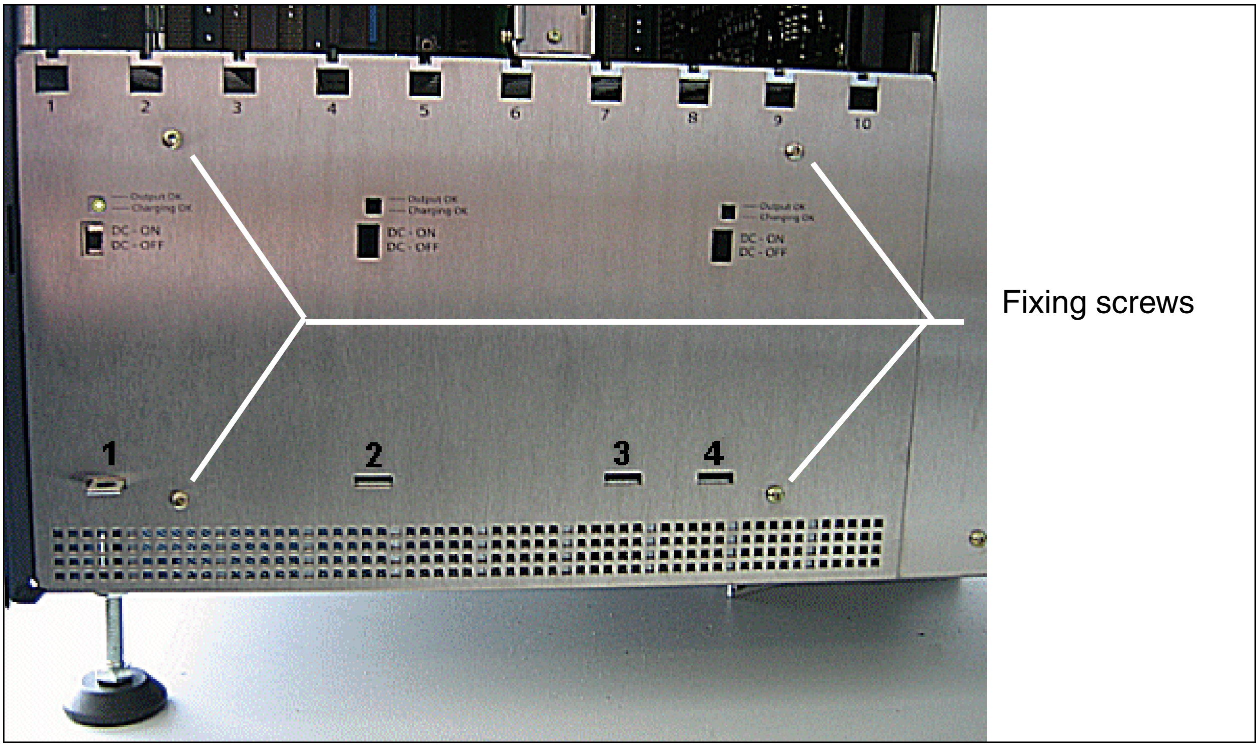

1
2
3
4
5
6
7
8
9
10
Output OK
Charging OK
DC - ON
DC - OFF
Fixing screws
1
2
3
4

Figure 4-19 HiPath 3800 - Slots for LUNA2 and REALS in the Basic Cabinet (With Outer Panel Mounted)

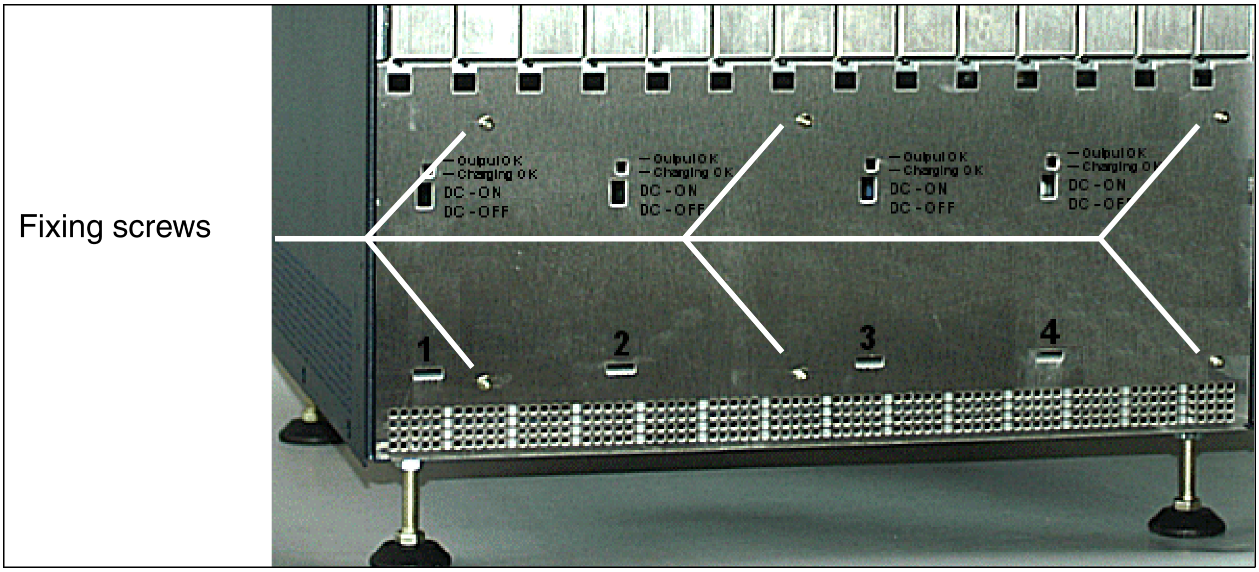

Fixing screws
Output OK
Charging OK
DC - ON
DC - OFF
1
2
3
4

Figure 4-20 HiPath 3800 - Slots for LUNA2 in the Expansion Cabinet (With Outer Panel Mounted)

- REALS
  Insert the REALS board into the slot marked 3 in the lower part of the shelf in the basic cabinet and apply pressure until you hear a click.

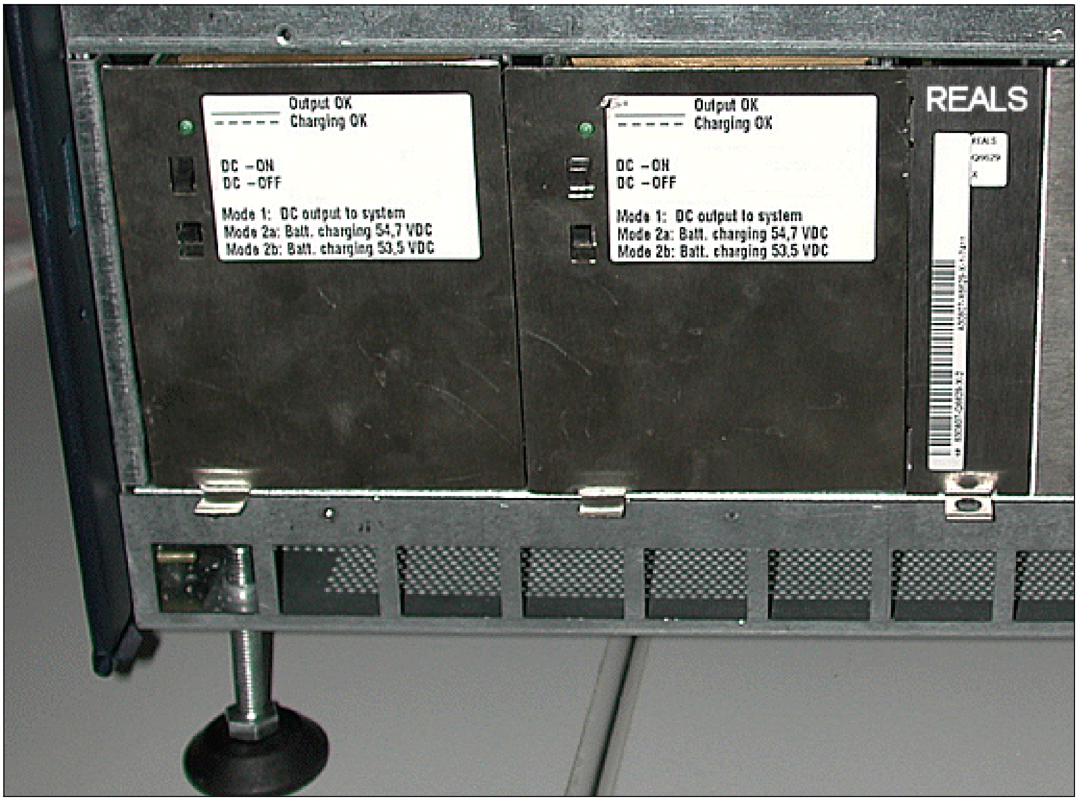

Output OK
Charging OK
DC -ON
DC -OFF
Mode 1: DC output to system
Mode 2a: Batt. charging 54,7 VDC
Mode 2b: Batt. charging 53,5 VDC
Output OK
Charging OK
DC -ON
DC -OFF
Mode 1: DC output to system
Mode 2a: Batt. charging 54,7 VDC
Mode 2b: Batt. charging 53,5 VDC
REALS

Figure 4-21 HiPath 3800 - Installing the REALS Board

The slots for the power supply units and for the REALS board must be covered with an outer panel before the system is started up. The outer panel is fixed onto the shelf with screws (see Figure 4-19).

4.2.5.3 Mounting Connector Panels (if required)

The HiPath 3800 has various connection options for connecting the peripherals. If you intend to use connector panels, mount the panels supplied as follows:

If		Then
Connector panels with RJ45 jacks (see Section 4.2.6.5)	Slot with STMD3	Attach a connector panel with 8 RJ45 jacks (S30807-Q6624-X) to the SIVAPAC connector on the backplane.
	Slot with SLCN SLMA SLMA8 SLMO2 SLMO8 TM2LP TMC16[1] TMDID[1]	Attach a connector panel with 24 RJ45 jacks (S30807-Q6622-X) to the SIVAPAC connector on the backplane.
	different or no assignment	Use filler panels to cover the backplane sections of other boards and empty board slots.
For U.S. only: Connector panels with CHAMP jack (see Section 4.2.6.6)	Slot with SLMA SLMA8 SLMO2 SLMO8 STMD3 TM2LP TMC16[1] TMDID[1]	Attach a connector panel with CHAMP jacks (S30807-Q6626-X) to the SIVAPAC connector on the backplane.
	different or no assignment	Use filler panels to cover the backplane sections of other boards and empty board slots.

If		Then
Connector panels with SIPAC 1 SU connectors (see Section 4.2.6.7)	Slot with SLCN SLMA SLMA8 SLMO2 SLMO8 STMD3 TM2LP TMC16[1] TMDID[1]	Plug a connector panel with SIPAC 1 SU connectors (S30807-Q6631-X) into the SIVAPAC connector on the backplane.
	different or no assignment	Use filler panels to cover the backplane sections of other boards and empty board slots.

[1] For U.S. only

4.2.5.4 Installing the SIVAPAC-SIPAC Board Adapter

The peripheral board slots on the HiPath 3800 are fitted with SIPAC 9 SU connectors. The TMEW2 and TMDID (for U.S. only) boards have SIVAPAC connector strips and as a result, SIVAPAC-SIPAC board adapters have to be installed in order to use them in HiPath 3800.

The SIVAPAC-SIPAC board adapter consists of three individual parts (refer to Figure 4-22):

- two adapter modules
- one startup module

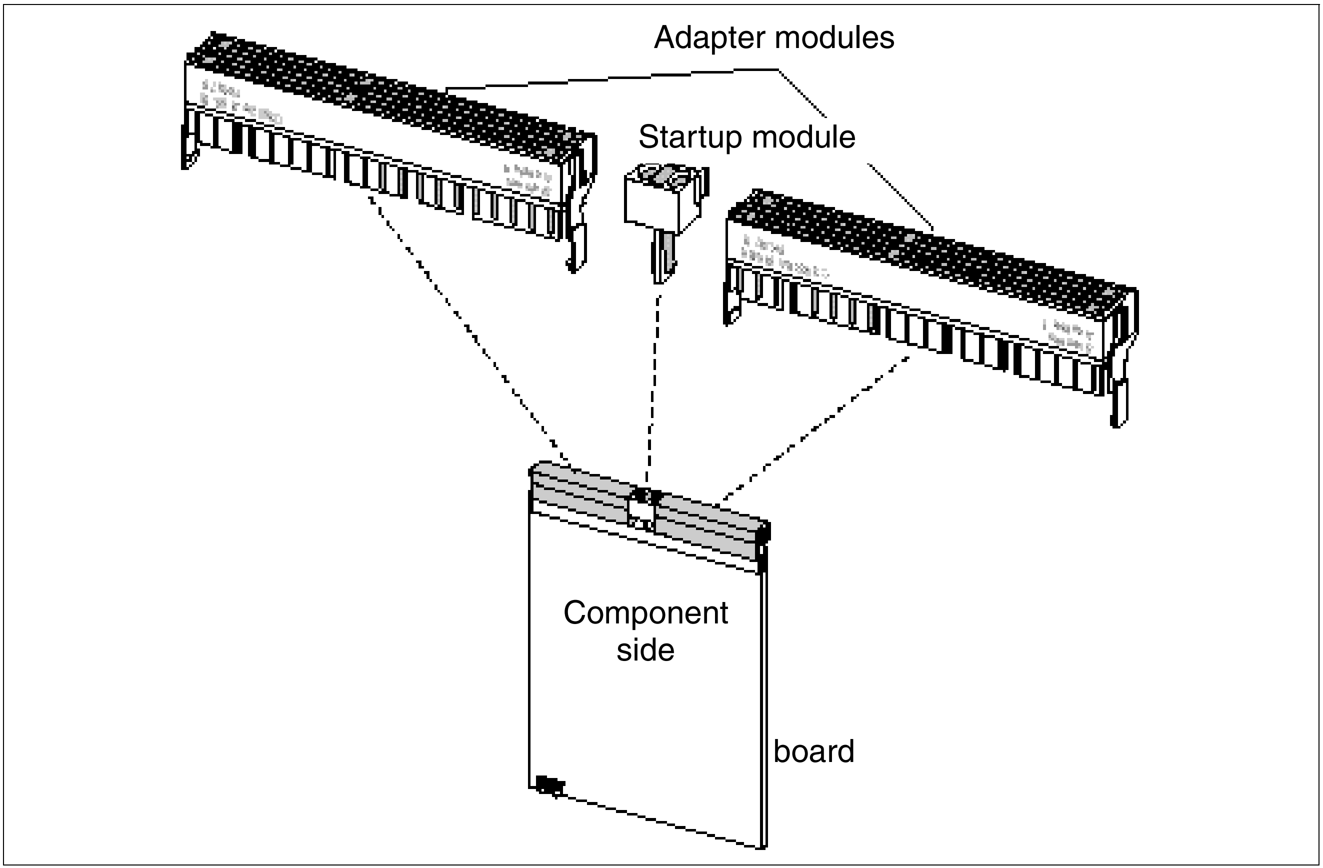


Figure 4-22 SIVAPAC-SIPAC Board Adapter

Procedure: Installing the SIVAPAC-SIPAC Board Adapter

Step	Activity
1.	Rotate the board so that the backplane connector is pointing towards you.
2.	Carefully pull the locking hooks (Figure 4-23, A) on an adapter module apart.
3.	Align the adapter module on the connector strip (Figure 4-23, B) of the board. The outside edges of the adapter module must match the outside edges of the connector strip.
4.	Make sure that the outermost row of pins on the adapter module and the outermost row of jacks on the connector strip are aligned flush with one another and press the adapter module fully into the connector strip.
5.	Close the locking hooks.
6.	Repeat steps 2 to 5 to install the second adapter module.
7.	Plug the startup module (Figure 4-23, C,) into the hotplug connector on the board.

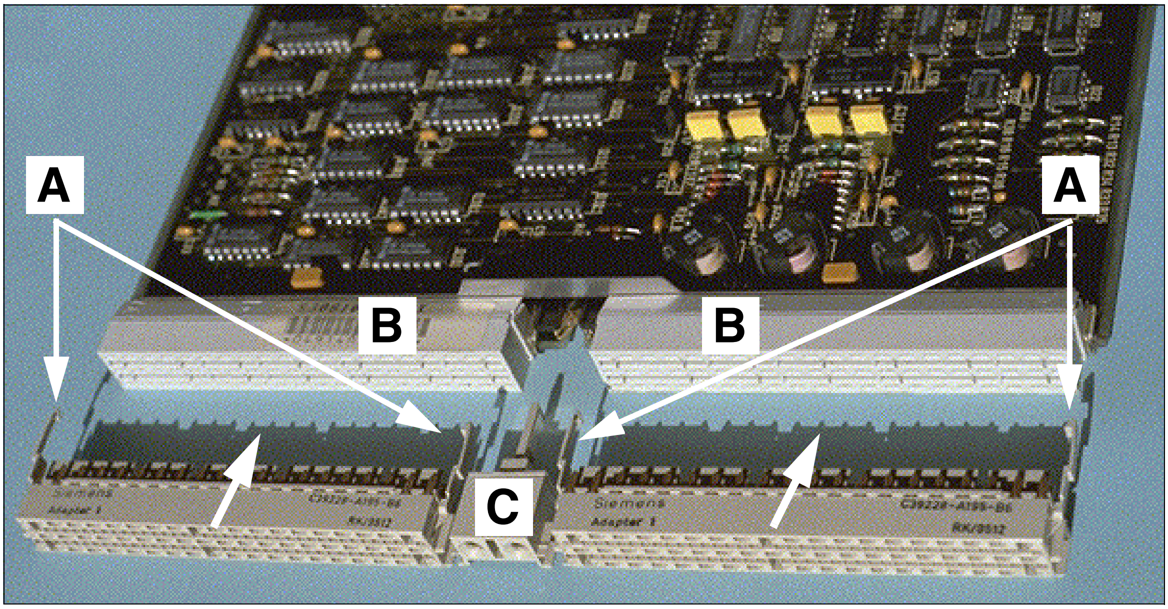
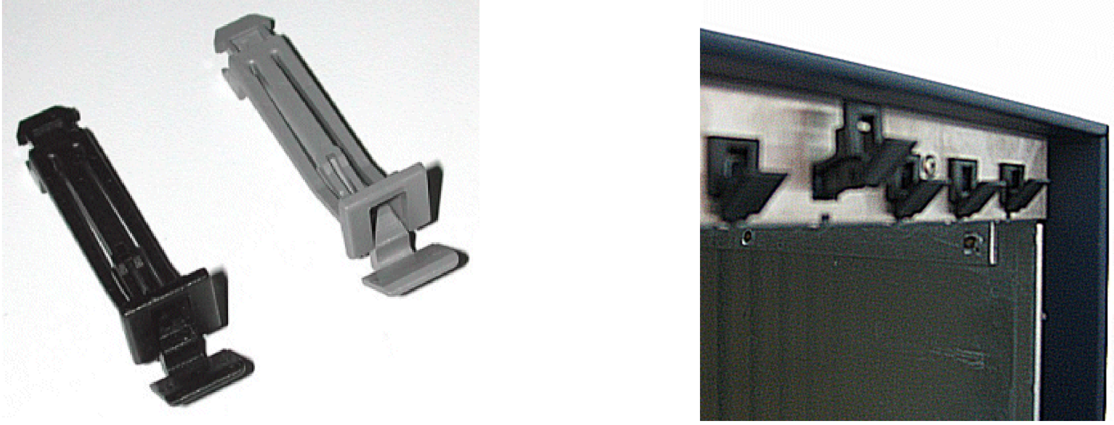


Figure 4-23 Installing the SIVAPAC-SIPAC Board Adapter

Replacing the Board Lock

Install the board adapter increases the board length. The boards jut out slightly from the board shelf. To ensure that these boards can still snap into place in spite of the board adapter, the upper black lock must be replaced with a gray lock.



Black and gray board locks

Remove the black lock

Figure 4-24 Replacing the Board Lock

4.2.5.5 Initializing the Boards

The system software detects the boards in ascending order, starting with the lowest installation position the first time the system starts up. The system initializes subscriber line circuits and ports in the sequence indicated by the arrow (Figure 4-25).

The system activates all connected boards in the following situations:

- The maximum configuration has not yet been reached. While sequentially scanning the slots for each board, the system software checks whether the maximum number of stations or trunks has been exceeded. If it has, the board is not activated. The board LED shows the board's status.
- At least one B channel on line trunk modules is available for the slot (only the available number of B channels is activated).

Assignment of subscriber line circuits and ports

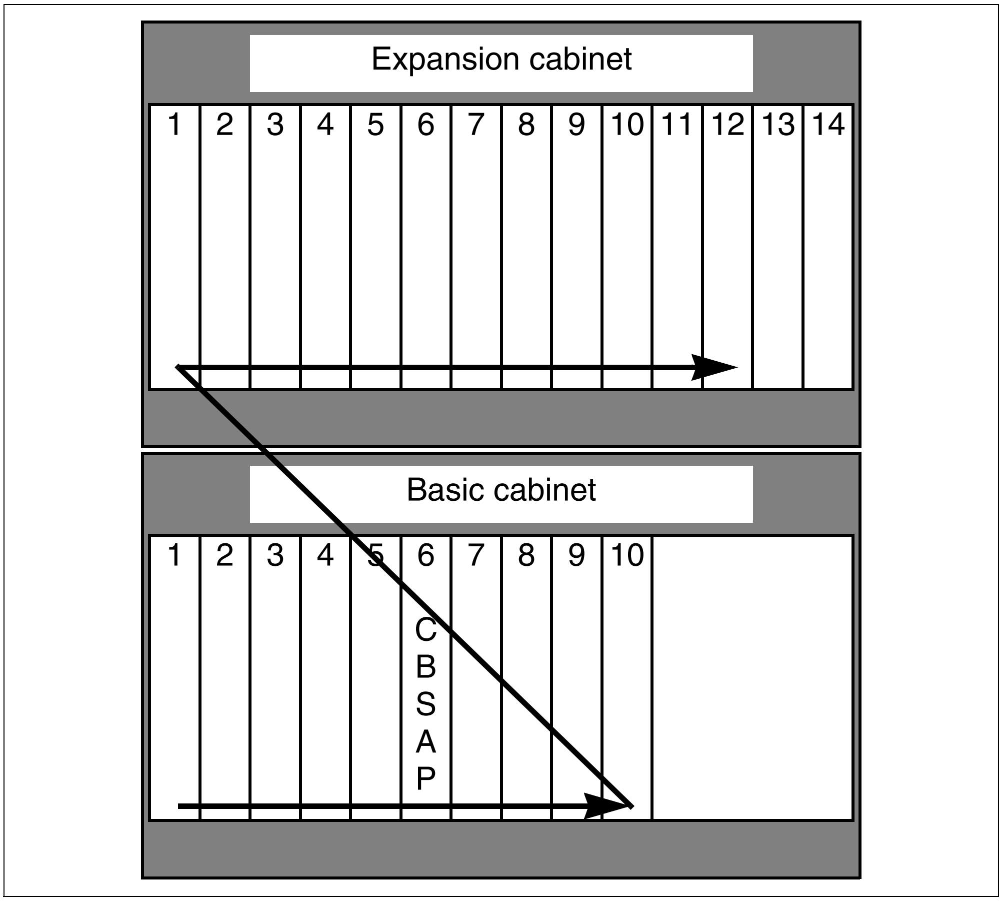


Figure 4-25 HiPath 3800 - Initialization of Subscriber Line Circuits and Ports

4.2.5.6 Distribution of the PCM Highway

HiPath 3800 provides PCM highway bundles with 2 x 4 PCM highways for each peripheral board slot. There are 32 time-division multiplex channels available for each PCM highway. Blockages occur if these are busy. The system cannot execute any more call requests.

To guarantee that the system operates without blocking, make sure when performing configuration that the boards on a PCM segment do not require more than the number of time-division multiplex channels available. The following figures show the PCM highways for both system cabinets of the HiPath 3800.

Basic cabinet: PCM highways

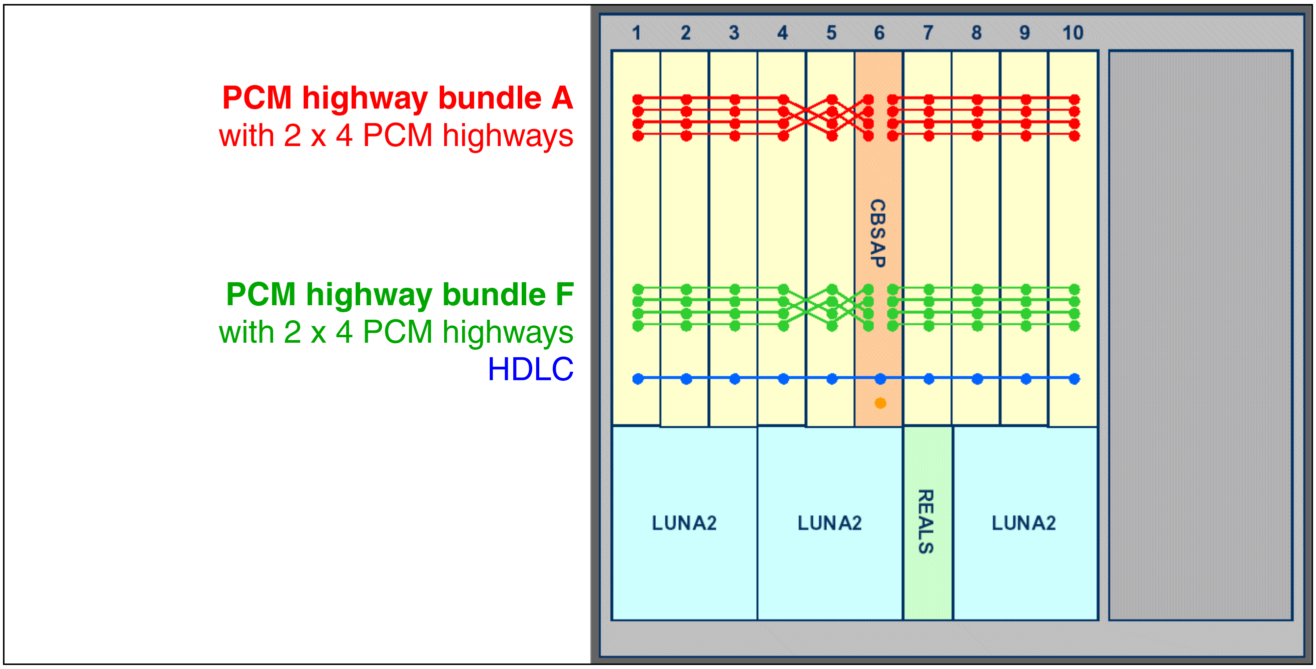


Figure 4-26 HiPath 3800 - PCM Highways in the Basic Cabinet

The basic cabinet provides two PCM highway bundles with 2 x 4 PCM highways each. There are 32 time-division multiplex channels available for each PCM highway.

The PCM highway bundles in the basic cabinet are used by peripheral boards according to the following rules:

- **Single-cabinet system** (basic cabinet only)
  With the exception of boards DIUN2, DIU2U (for U.S. only), IVMNL, IVMN8 and STMI2, the peripheral boards only use the PCM highways of bundle A:
  - PCM segment for board slots 1 – 5 = 128 time-division multiplex channels (four PCM highways)

- PCM segment for board slots 7 – 10 = 128 time-division multiplex channels (four PCM highways)

DIUN2, DIU2U (for U.S. only), IVMNL, IVMN8 and STMI2 use the PCM highways from bundle F. Thus there are an additional 128 time-division multiplex channels available for slots 1 – 5 and for slots 7 – 10 for these boards.
If more than the 2 x 128 time-division multiplex channels from bundle F are required because of the configuration with these boards, the system will automatically resort to time-division multiplex channels from bundle A.

- **Two-cabinet system** (basic cabinet + expansion cabinet)
All peripheral boards use the PCM highways from bundle A only.

Expansion cabinet: PCM highways

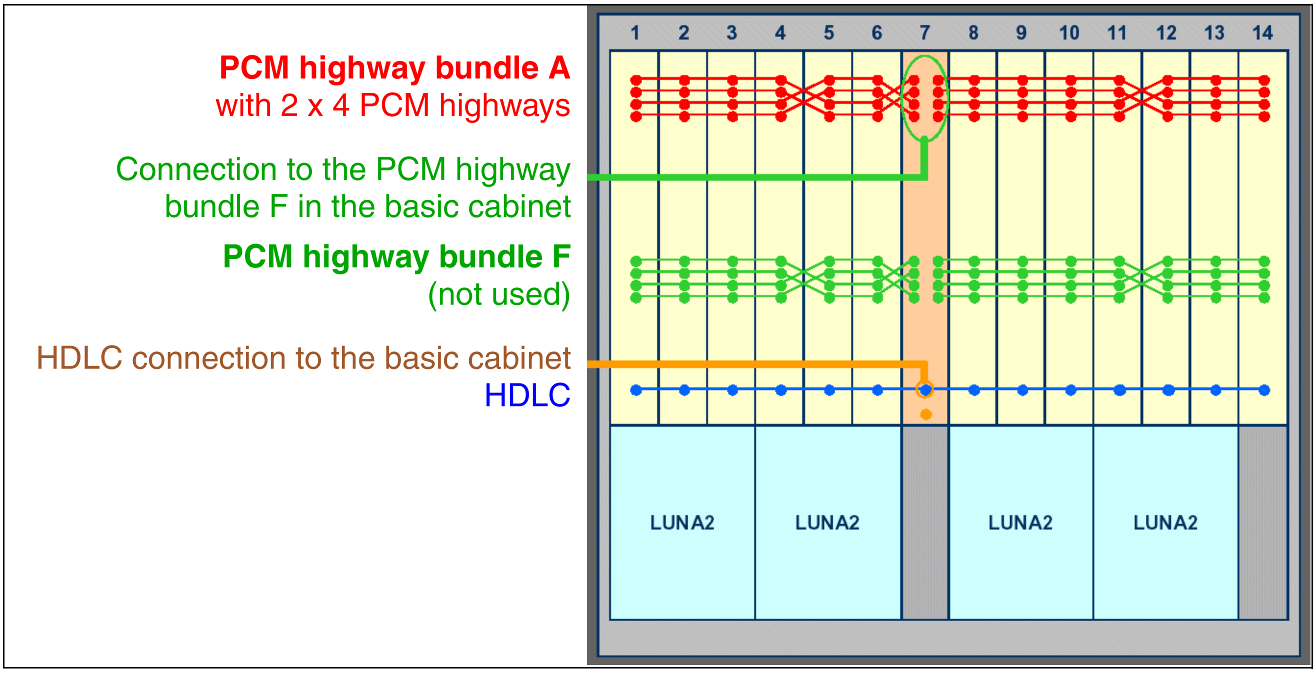

PCM highway bundle A
with 2 x 4 PCM highways
Connection to the PCM highway bundle F in the basic cabinet
PCM highway bundle F
(not used)
HDLC connection to the basic cabinet
HDLC
1
2
3
4
5
6
7
8
9
10
11
12
13
14
LUNA2
LUNA2
LUNA2
LUNA2

Figure 4-27 HiPath 3800 - PCM Highways in the Expansion Cabinet

The expansion cabinet provides a PCM highway bundle with 2 x 4 PCM highways. There are 32 time-division multiplex channels available for each PCM highway.

- PCM segment for board slots 1 – 6 = 128 time-division multiplex channels (four PCM highways)
- PCM segment for board slots 8 – 14 = 128 time-division multiplex channels (four PCM highways)

PCM highway bundle F is not used.

Time-division multiplex channels for peripheral boards

The following table lists the number of time-division multiplex channels that the different boards require.

Table 4-4 Maximum Number of Time-Division Multiplex Channels Required Per Board

Board	Maximum number of time-division multiplex channels required
DIU2U	60
DIUN2	60
IVMN8	8
IVMNL	24
SLCN	64[1]
SLMA	24[2]
SLMA8	8[2]
SLMO2	48[2] [3]
SLMO8	16[2] [3]
STMD3	16
STMI2	32
STMI2 + PDMX[4]	64
TM2LP	8
TMC16	16
TMDID	8
TMEW2	4

1 A time-division multiplex channel is required if a call is being conducted over the “home SLCN board” of a mobile telephone. If a call is being conducted over a “Current location SLCN board”, additional time-division multiplex channels will be required. More information is provided in Section 11.6, “Multi-SLC and System-Wide Networking”.
2 The current number of time-division multiplex channels required is determined by the number of active stations.
3 The maximum number of masters **and** slaves possible is taken into consideration.
4 PDMX is not currently released.

4.2.5.7 Static Traffic Capacity

The static traffic capacity of the HiPath 3800 system can be determined as follows.

Table 4-5 HiPath 3800 - Static Traffic Capacity

HiPath 3800	Slots per PCM segment	Static traffic capacity per PCM segment	Total static traffic capacity of the system
Single-cabinet system (see Page 4-45)	1 – 5	128 erlangs + (128 erlangs[1])	512 erlangs
	7 – 10	128 erlangs + (128 erlangs[1])	
Two-cabinet system (see Page 4-46)	1 – 5	128 erlangs	512 erlangs
	7 – 10	128 erlangs	
	11 – 16	128 erlangs	
	18 – 24	128 erlangs	

[1] The basic cabinet provides two PCM highway bundles with 2 x 4 PCM highways each. DIUN2, DIU2U (for U.S. only), IVMNL, IVMN8 and STMI2 use the PCM highways from bundle F. Thus there are an additional 128 time-division multiplex channels available for slots 1 – 5 and for slots 7 – 10 for these boards in the basic cabinet. If HiPath 3800 is used as a two-cabinet system, a use of PCM highway bundle F is not possible.

4.2.6 Connecting the Cable to the Backplane

All cables that leave the system cabinet must be attached to the metal back panel using cable ties.

Connection options

Peripheral devices can be connected up to the HiPath 3800 in a number of different ways:

- SIVAPAC connector on the backplane for connecting the external main distribution frame via CABLUs (prefabricated cabling units) or for connecting external patch panels (see Section 4.2.6.4).
- Connector panels with RJ45 jacks for direct connection of peripherals (see Section 4.2.6.5). The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- For U.S. Only: Connector panels with CHAMP jack for direct connection of peripherals (see Section 4.2.6.6). The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- Connector panels each with two SIPAC 1 SU connectors for connecting the external mail distribution frame MDFU-E or external patch panels using CABLUs (see Section 4.2.6.7). The connector panels are clipped onto the SIVAPAC connectors on the backplane.

The type of connection used will be decided in consultation with the customer on conclusion of the agreement. The cabinets will be delivered accordingly with or without clipped-on connector panels.

⚠ **Danger**
Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

4.2.6.1 Backplane of the Basic Cabinet

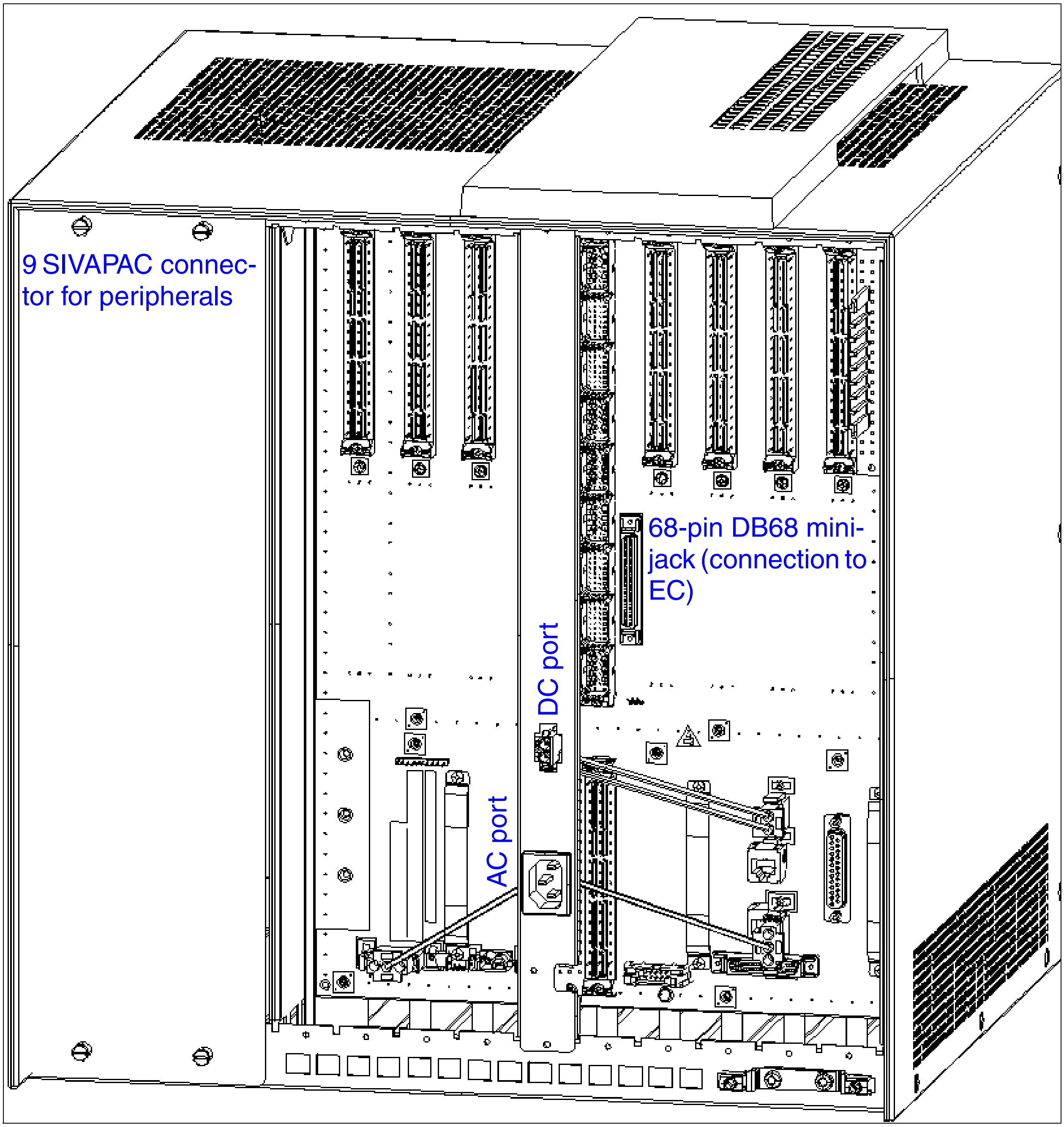

9 SIVAPAC connector for peripherals
68-pin DB68 mini-jack (connection to EC)
DC port
AC port

Figure 4-28 HiPath 3800 - Backplane (S30804-Q5392-X) of the Basic Cabinet

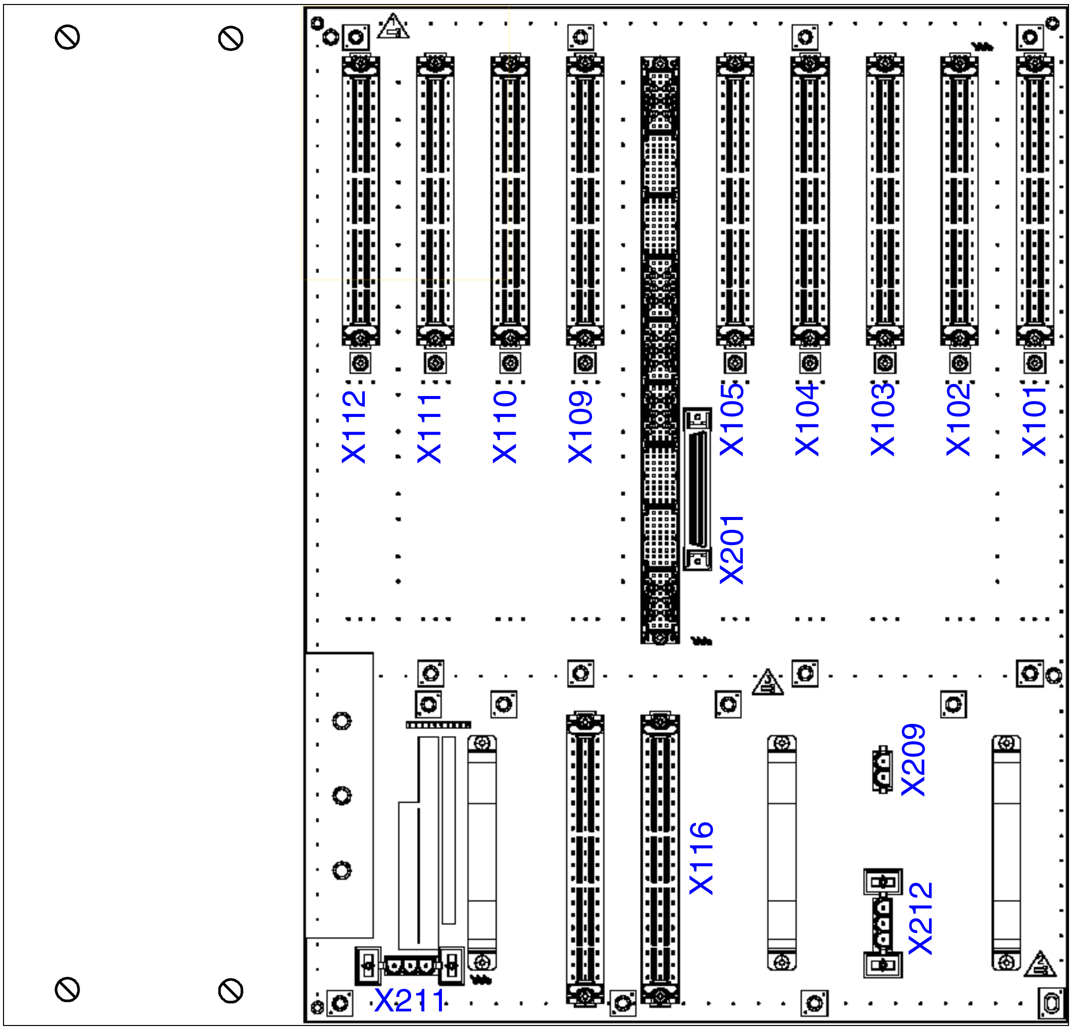

X112
X111
X110
X109
X105
X104
X103
X102
X101
X201
X209
X116
X212
X211

Figure 4-29 HiPath 3800 - Connectors and Jacks on the Backplane of the Basic Cabinet

Table 4-6 HiPath 3800 - Assignment of Connectors and Jacks on the Backplane of the Basic Cabinet

Connector	Function
X101 – X105	SIVAPAC connector for connecting peripherals: CABLUs and open-end cables are used for connection to the MDFU-E or to an external patch panel (see Section 4.2.6.4). Note: The SIVAPAC connectors can have the following connector panels: ● Connector panels with RJ45 jacks for direct connection of peripherals (see Section 4.2.6.5). ● For U.S. only: Connector panels with CHAMP jack for direct connection of peripherals (see Section 4.2.6.6). ● Connector panels each with two SIPAC 1 SU connectors for connecting an external main distribution frame or external patch panel using CABLUs (see Section 4.2.6.7).
X109 – X112	
X116	SIVAPAC connectors for picking up the signals from the REALS board. CABLUs for connection to the MDFU-E (jumper strip for 25 TW): ● C39195-A7267-A372: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) ● C39195-A7267-A373: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) Open-end cable (24 TW) for connection to an external patch panel: ● S30267-Z196-A150: 15 m in length ● S30267-Z196-A250: 25 m in length ● S30267-Z196-A350: 35 m in length ● S30267-Z196-A550: 55 m in length ● S30267-Z196-A950: 95 m in length
X201	68-pin DB68 mini-jack for connecting the cable C39195-Z7611-A10 to the expansion cabinet (for the DBSAP board)
X209	DC port
X211, X212	AC power

4.2.6.2 Expansion Cabinet Backplane

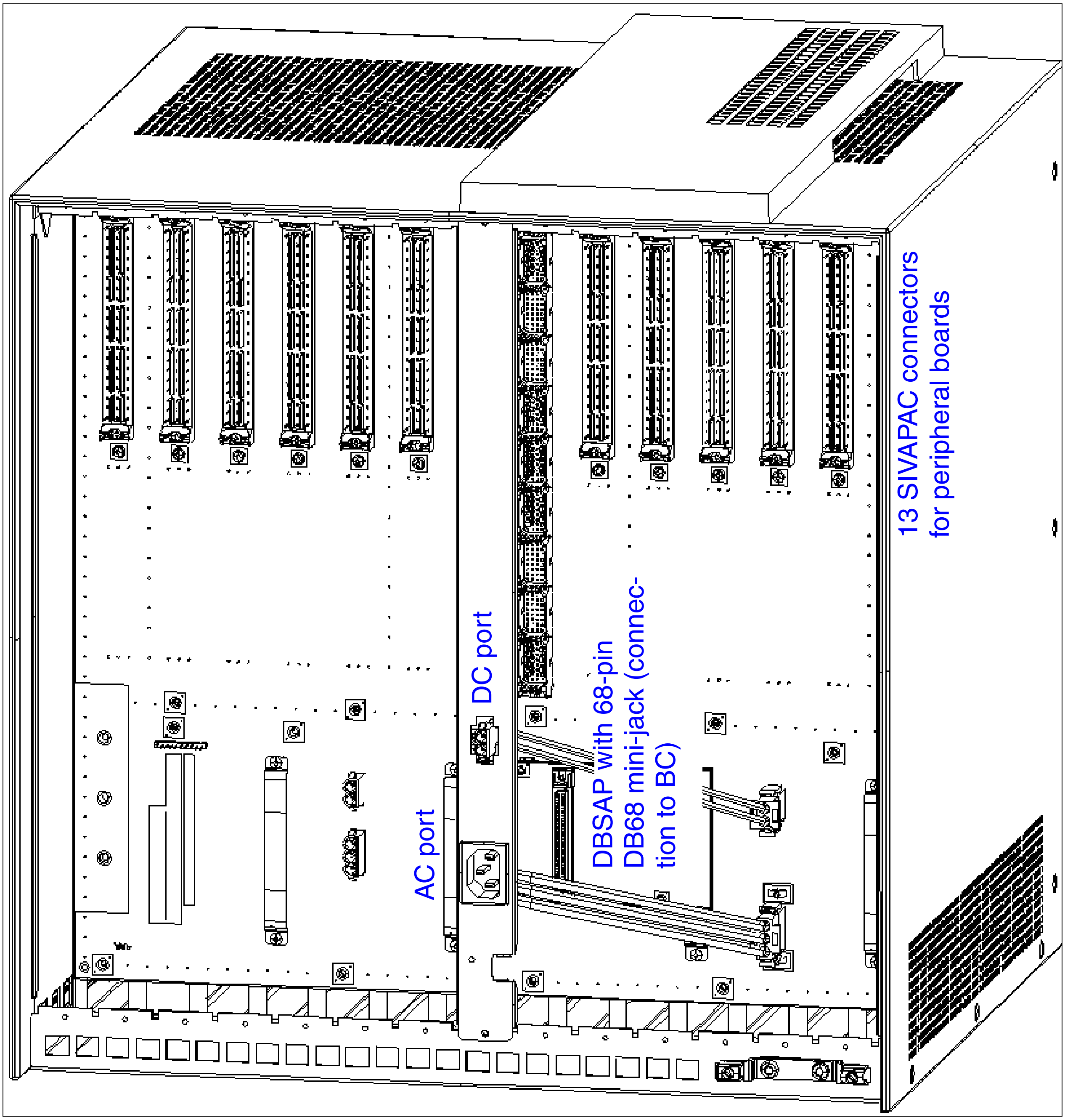

AC port
DC port
DBSAP with 68-pin DB68 mini-jack (connection to BC)
13 SIVAPAC connectors for peripheral boards

Figure 4-30 HiPath 3800 - Expansion Cabinet Backplane (S30804-Q5393-X)

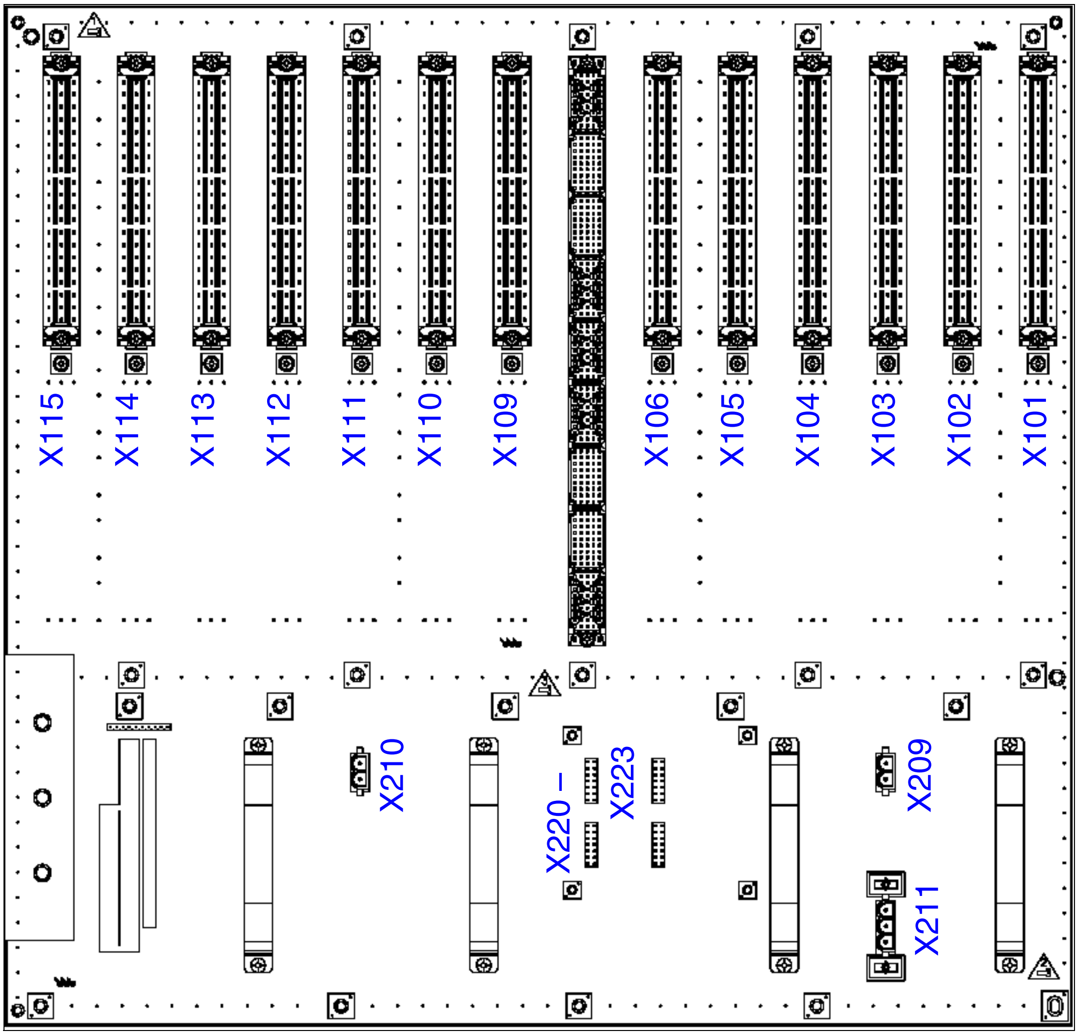

X115
X114
X113
X112
X111
X110
X109
X106
X105
X104
X103
X102
X101
X210
X220 –
X223
X209
X211

Figure 4-31 HiPath 3800 - Connectors and Jacks on the Backplane of the Expansion Cabinet

Table 4-7 HiPath 3800 - Assignment of Connectors and Jacks on the Backplane of the Expansion Cabinet

Connector	Function
X101 – X106	SIVAPAC connector for connecting peripherals: CABLUs and open-end cables are used for connection to the MDFU-E or to an external patch panel (see Section 4.2.6.4). Note: The SIVAPAC connectors can have the following connector panels: ● Connector panels with RJ45 jacks for direct connection of peripherals (see Section 4.2.6.5). ● For U.S. only: Connector panels with CHAMP jack for direct connection of peripherals (see Section 4.2.6.6). ● Connector panels each with two SIPAC 1 SU connectors for connecting an external main distribution frame or external patch panel using CABLUs (see Section 4.2.6.7).
X109 – X115	
X209, X210	DC port
X211	AC power
X220 – X223	Connections for plugging in the DBSAP board. DBSAP has a 68-pin DB68 mini-jack for connecting the cable C39195-Z7611-10 to the basic cabinet (to the jack X201).

4.2.6.3 Connecting Cables Between the Basic and Expansion Cabinet

The connection cable C39195-Z7611-A10 has to be connected up for feeding the HDLC, PCM, and clock signals from the basic cabinet to the expansion cabinet:

- Basic cabinet = X201 jack
- Expansion cabinet = DBSAP board

> To ensure smooth operation, use only shielded cables with a maximum length of 1 m.

4.2.6.4 Connecting Peripherals to the SIVAPAC Connector on the Backplane

The boards should be installed in the cabinets as described in Section 4.2.5.

> ⚠ **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
> The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Use the CABLUs (prefabricated cabling units) that are listed in the following table to establish the connection with the MDFU-E. Open-end cables must be used if an external patch panel is being used. See also Section 4.2.7, “Using an External Main Distribution Frame or External Patch Panel”.

CABLUs and open-end cables for SIVAPAC connectors

If	Then
Slot with SLCN SLMA8 SLMO8 STMD3 TM2LP TMC16 [1] TMDID[1]	CABLUs for connection between backplane (SIVAPAC connector) and MDFU-E (splitting strip for 16 TW): ● C39195-A7267-A370: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) ● C39195-A7267-A371: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU for connection between backplane (SIVAPAC connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): ● S30267-Z333-A20: 2 m in length (refer to Figure 4-42) ● S30267-Z333-A50: 5 m in length (refer to Figure 4-42) Open-end cable (24 TW) for connection between backplane (SIVAPAC connector) and external patch panel: ● S30267-Z196-A150: 15 m in length ● S30267-Z196-A250: 25 m in length ● S30267-Z196-A350: 35 m in length ● S30267-Z196-A550: 55 m in length ● S30267-Z196-A950: 95 m in length

If	Then
Slot with SLMA SLMO2	CABLUs for connection between backplane (SIVAPAC connector) and MDFU-E (jumper strip for 25 TW): ● C39195-A7267-A372: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) ● C39195-A7267-A373: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU for connection between backplane (SIVAPAC connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): ● S30267-Z333-A20: 2 m in length (refer to Figure 4-42) ● S30267-Z333-A50: 5 m in length (refer to Figure 4-42) Open-end cable (24 TW) for connection between backplane (SIVAPAC connector) and external patch panel: ● S30267-Z196-A150: 15 m in length ● S30267-Z196-A250: 25 m in length ● S30267-Z196-A350: 35 m in length ● S30267-Z196-A550: 55 m in length ● S30267-Z196-A950: 95 m in length

[1] For U.S. only

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

Closing the backplane of the system cabinets

> After the cable has been connected, the backplane of the basic cabinet and that of the expansion cabinet (if applicable) must be closed with the dummy panels provided (C39165-A7075-C44).

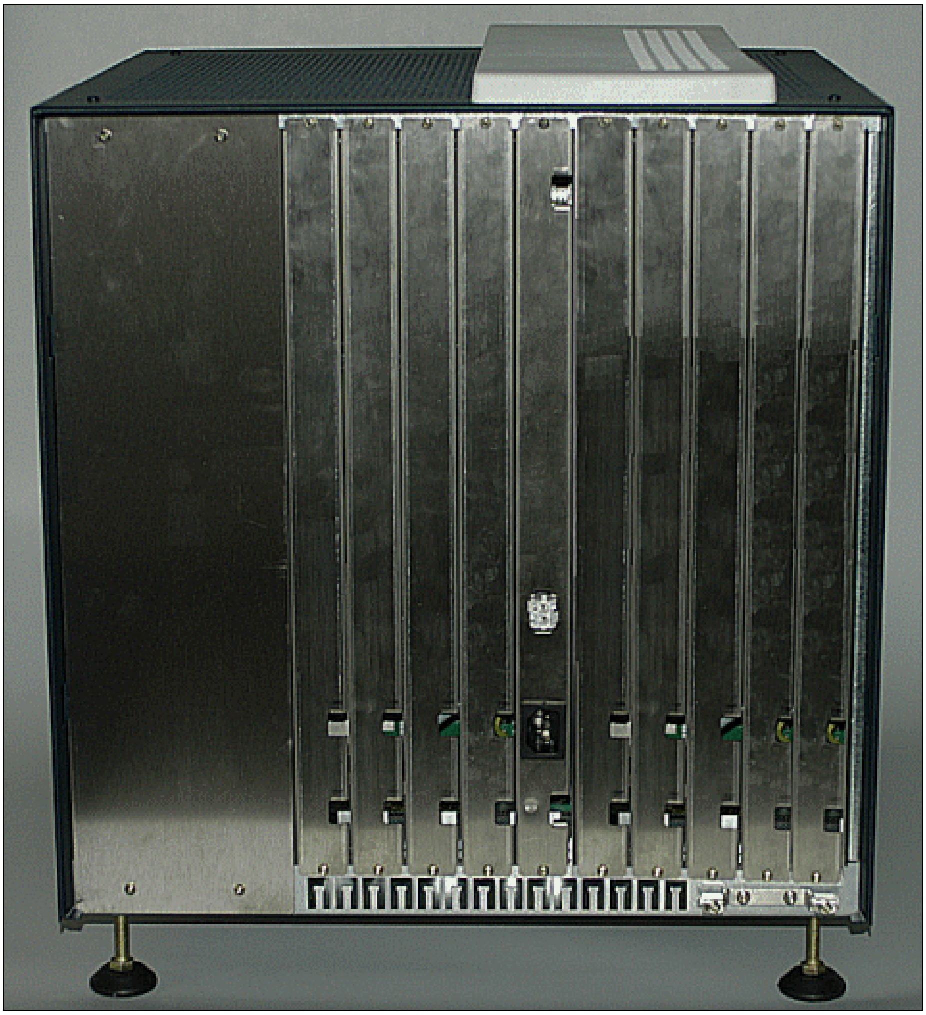
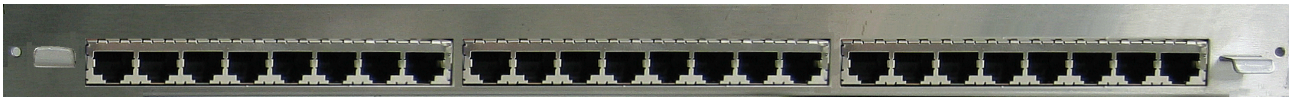


Figure 4-32 HiPath 3800 - Backplane of the Basic Cabinet with Mounted Filler Panels

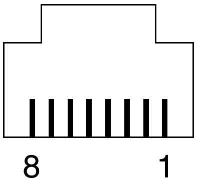
4.2.6.5 Connecting Peripherals to the Connector Panels with RJ45 Jacks

The boards should be installed in the cabinets as described in Section 4.2.5. The connector panels plugged into the SIVAPAC connectors of the backplane are equipped with eight or 24 RJ45 jacks according to the relevant board.



Connector panel with 24 RJ45 jacks

Connector panel with eight RJ45 jacks



8-pin RJ45 jack

Figure 4-33 HiPath 3800 - connector panels with RJ45 Jacks

Danger
Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Connect the peripheral directly to the 8-pin RJ45 jacks on the connector panels.

If	Then
Slot with STMD3	Connector panel with eight RJ45 jacks: S30807-Q6624-X The RJ45 jacks are configured with four wires. S_0 stations can be directly connected (1:1 cable). The receive and send lines should be switched for trunk connections.

If	Then
Slot with SLCN SLMA SLMA8 SLMO2 SLMO8 TM2LP TMC16[1] TMDID[1]	Connector panel with 24 RJ45 jacks: S30807-Q6622-X The RJ45 jacks are configured with two wires.
different or no assignment	The backplane sections of other boards and empty board slots must be covered with filler panels.

[1] For U.S. only

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

4.2.6.6 For U.S. only: Connecting Peripherals to the Connector Panels with CHAMP Jack

The boards should be installed in the cabinets as described in Section 4.2.5. The S30807-Q6626-X connector panels attached to the SIVAPAC connectors on the backplane are equipped with a CHAMP jack.

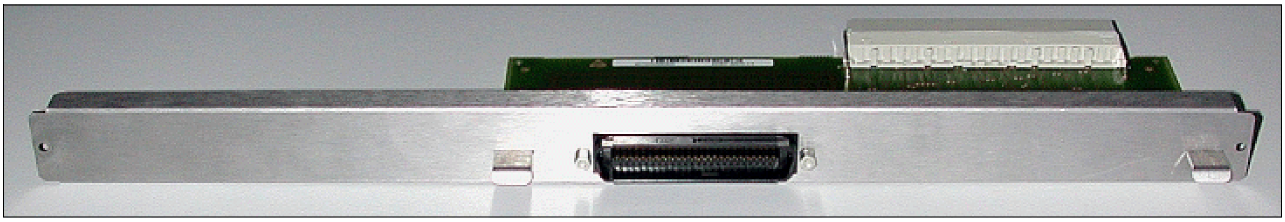


Figure 4-34 HiPath 3800 - Connector Panel with CHAMP Jack (for U.S. only)

> ⚠ **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
> The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Connect the peripheral directly to the CHAMP jack in the connector panels.

If	Then
Slot with peripheral card	A cable with CHAP jack should be used to connect to a main distributor frame or external patch panel.
No assignment	The backplane sections with empty board slots must be covered with filler panels.

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

4.2.6.7 Connecting Peripherals to the Connector Panels with SIPAC 1 SU Connectors

The boards should be installed in the cabinets as described in Section 4.2.5. The S30807-Q6631-X connector panels attached to the SIVAPAC connectors on the backplane have two SIPAC 1 SU connectors each.

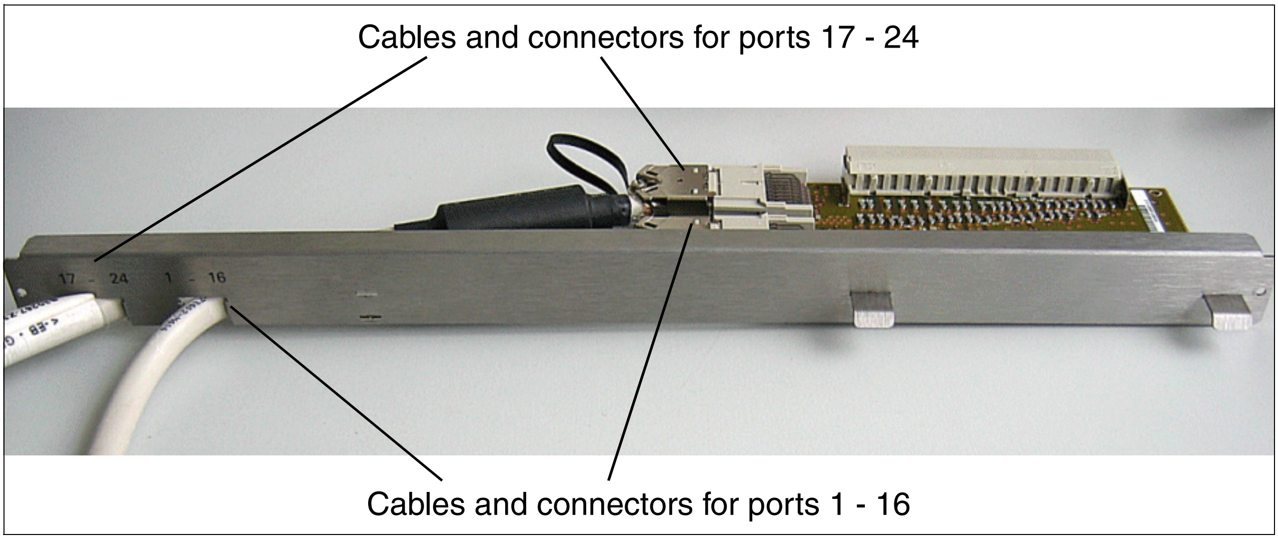

Cables and connectors for ports 17 - 24
17 - 24
1 - 16
Cables and connectors for ports 1 - 16

Figure 4-35 HiPath 3800 - Connector Panel with Two SIPAC 1 SU Connectors (S30807-Q6631-X)

> ⚠ **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
> The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Use the CABLUs that are listed in the following table to establish the connection with the MDFU-E or an external patch panel. See also Section 4.2.7, “Using an External Main Distribution Frame or External Patch Panel”.

In special cases where the prefabricated CABLUs cannot be used, open-end cables should be used.

CABLUs and open-end cables for SIPAC 1 SU connectors

If	Then
Slot with SLCN SLMA8 SLMO8 STMD3 TM2LP TMC16 [1] TMDID[1]	CABLUs for connection between connector panel (SIPAC 1 SU connectors) and MDFU-E (splitting strip for 16 TW): ● S30269-Z100-A11: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) ● S30269-Z100-A21: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU with 16 TW for connection between connector panel (SIPAC 1 SU connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): ● S30267-Z362-A20: 2 m in length (refer to Figure 4-42) Open-end cable (16 TW) for connection between backplane (SIPAC 1 SU connectors) and external patch panel: ● S30267-Z192-A60: Open-end cable with 16 TW, 6 m in length ● S30267-Z192-A100: Open-end cable with 16 TW, 10 m in length ● S30267-Z192-A200: Open-end cable with 16 TW, 20 m in length (Information on the required stripped lengths for open-end cables is provided in Figure 4-47.)
Slot with SLMA SLMO2	CABLUs for connection between connector panel (SIPAC 1 SU connectors) and MDFU-E (jumper strip for 25 TW): ● S30269-Z100-A14: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) ● S30269-Z100-A24: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU with 24 TW for connection between connector panel (SIPAC 1 SU connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): ● S30267-Z363-A20: 2 m in length (refer to Figure 4-42) Open-end cable (16 TW) for connection between backplane (SIPAC 1 SU connectors) and external patch panel: ● S30267-Z192-A60: Open-end cable with 16 TW, 6 m in length ● S30267-Z192-A100: Open-end cable with 16 TW, 10 m in length ● S30267-Z192-A200: Open-end cable with 16 TW, 20 m in length (Information on the required stripped lengths for open-end cables is provided in Figure 4-47.)
different or no assignment	The backplane sections of other boards and empty board slots must be covered with filler panels.

[1] For U.S. only

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

4.2.7 Using an External Main Distribution Frame or External Patch Panel

The HiPath 3800 has various connection options for connecting the peripherals. The type of connection used will be decided in consultation with the customer on conclusion of the agreement. This may involve the implementation of an external main distribution frame or an external patch panel.

This section contains information on the following external components:

- Main distribution frame MDFU-E, Section 4.2.7.1
- Patch panel S30807-K6143-X, Section 4.2.7.2
- S_0 patch panel C39104-Z7001-B3, Section 4.2.7.3
- For U.S. only: Connecting Network Facilities, Section 4.2.7.4

4.2.7.1 Using an External Main Distribution Frame MDFU-E S30805-U5283-X

For U.S. only:

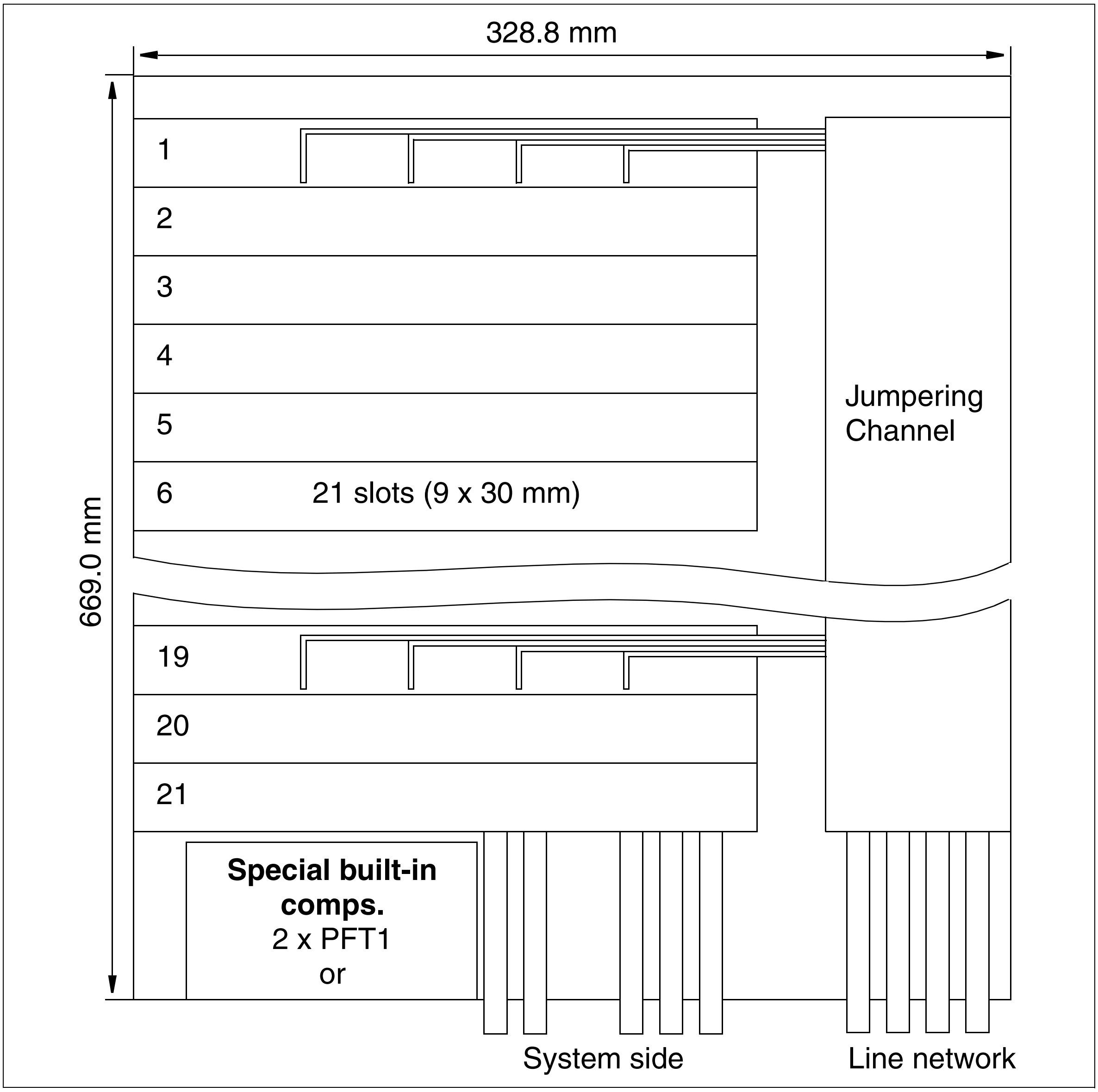

328.8 mm
669.0 mm
1
2
3
4
5
6
21 slots (9 x 30 mm)
Jumpering
Channel
19
20
21
Special built-in comps.
2 x PFT1
or
System side
Line network

Figure 4-36 MDFU-E - Layout and Dimensions (669.0 x 328.8 x 125.4 mm)

Not more than 21 CABLUs per MDFU-E with one 16-TW strip or 25-TW strip (9 x 30 mm) can be implemented.

4.2.7.1.1 Mounting the Main Distribution Frame (MDFU-E)

The MDFU-E main distribution frame should be installed in the direct vicinity of the system (note length of connection cable) and at eye level.

The packing material contains a drawing that can be used as a drilling template.

Procedure for wall mounting

Step	Activity
1.	Use the template to drill the holes.
2.	Insert the wall anchors and screw in the screws, leaving 5 mm projecting.
3.	Remove the housing cover and mount the MDFU-E on the brackets.
4.	Tighten the screws through the holes.

4.2.7.1.2 Laying the Line Network and Jumpers on the MDFU-E

⚠ **Danger**
Be sure to connect the main protective earthing terminal on all system cabinets and all main distribution frames to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).

Jumpers, external line network

Most main distribution frames do not have an external side. You must jumper them to the incoming line network (see jumpering duct, Figure 4-36). Use a standard wiring tool for laying the cable wires.

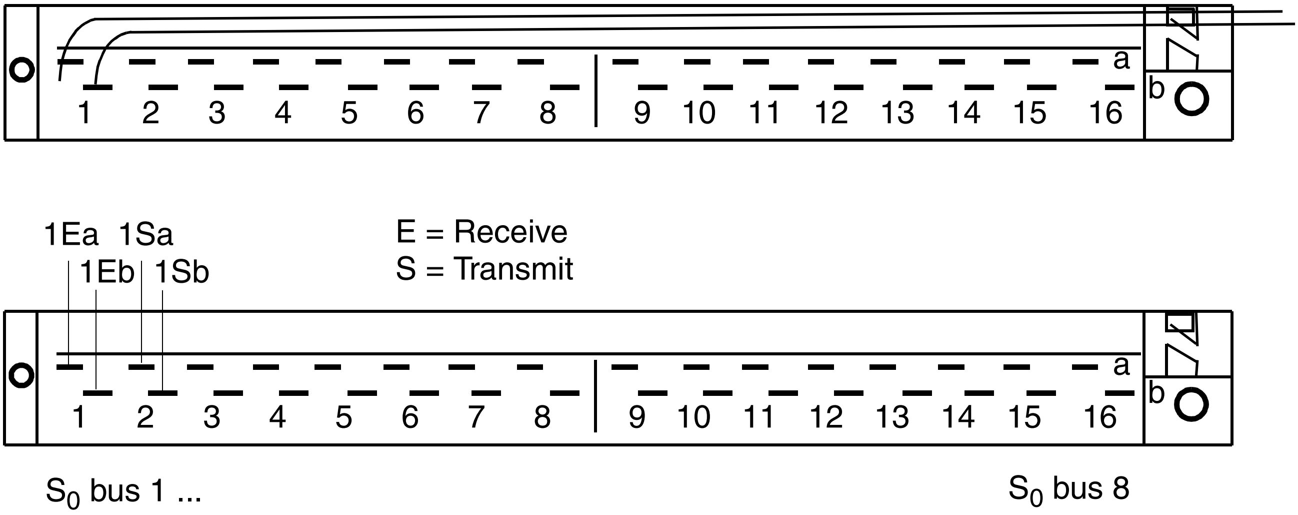
Surge protector

To divert surges caused by lightning, insert surge protectors on

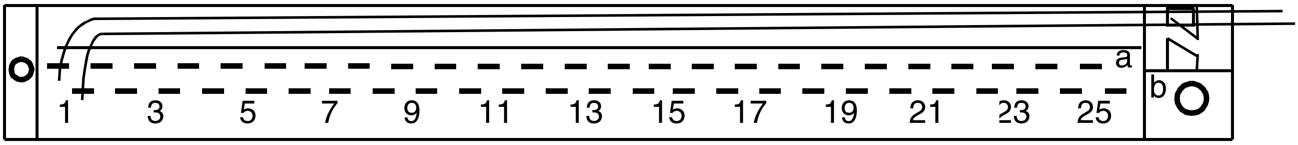
- lines that leave the system buildings (outside stations)
- lines > 500 m long.

Connect the polarized surge protectors to the plugging locations on the splitting strip described above (see Figure 4-38).

Splitting and jumper strips


a
b
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1Ea 1Sa
1Eb 1Sb
E = Receive
S = Transmit
a
b
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
S_0 bus 1 ...
S_0 bus 8

Splitting strip for 16 TW (C39334-A166-A1)

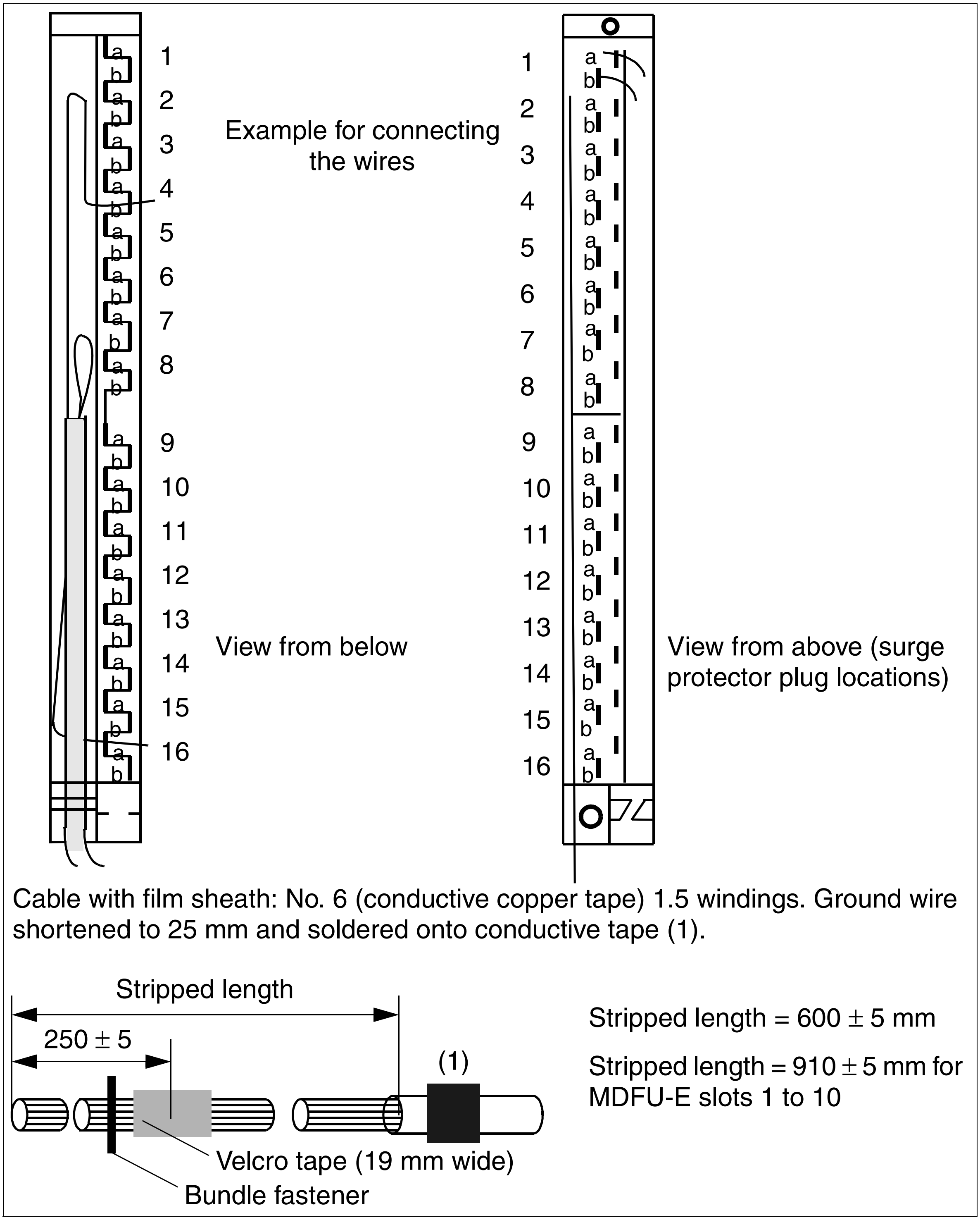

a
b
1 3 5 7 9 11 13 15 17 19 21 23 25

Jumper strip for 25 TW (C39334-A166-A3)

No. 25 not used

Figure 4-37 Assignment (Numbering) of the Splitting/Jumper Strips (view from above)

Stripping the open-end cable for the MDFU-E


a
b
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Example for connecting the wires
View from below
View from above (surge protector plug locations)
Stripped length
250 ± 5
(1)
Velcro tape (19 mm wide)
Bundle fastener

Cable with film sheath: No. 6 (conductive copper tape) 1.5 windings. Ground wire shortened to 25 mm and soldered onto conductive tape (1).

Stripped length = 600 ± 5 mm

Stripped length = 910 ± 5 mm for MDFU-E slots 1 to 10

Figure 4-38 Stripping an Open-End Cable for the MDFU-E

Color Codes for the Open-End Cable

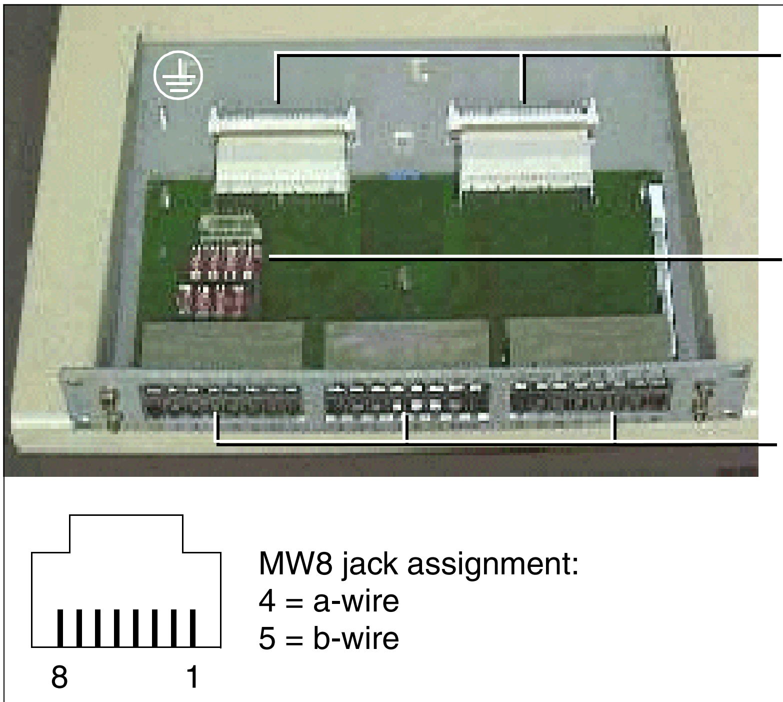
Table 4-8 Color Codes for the Open-End Cable

Color Group	Pair	a-Wire (Tip)	b-Wire (Ring)	Color Group	Pair	a-Wire (Tip)	b-Wire (Ring)
1	1	wht/blu		4	16	yel/blu	
			blu/wht				blu/yel
	2	wht/ora			17	yel/ora	
			ora/wht				ora/yel
	3	wht/grn			18	yel/grn	
			grn/wht				grn/yel
	4	wht/brn			19	yel/brn	
			brn/wht				brn/yel
	5	wht/gry			20	yel/gry	
			gry/wht				gry/yel
2	6	red/blu		5	21	vio/blu	
			blu/red				blu/vio
	7	red/ora			22	vio/ora	
			ora/red				ora/vio
	8	red/grn			23	vio/grn	
			grn/red				grn/vio
	9	red/brn			24	vio/brn	
			brn/red				brn/vio
	10	red/gry		Note: In the case of cables with 16 double wires, the specifications for pairs 17 to 24 are not relevant.			
			gry/red				
3	11	blk/blu					
			blu/blk				
	12	blk/ora					
			ora/blk				
	13	blk/grn					
			grn/blk				
	14	blk/brn					
			brn/blk				
	15	blk/gry					
			gry/blk				

4.2.7.2 Inserting the External Patch Panel S30807K6143-X

Structure

All incoming cables must be attached to the patch panel using cable ties.



SIVAPAC edge connector: port for CABLU connection to the backplane

Eight surge protector plug locations

Front panel with 3 x 16 MW8 jacks

MW8 jack assignment:
4 = a-wire
5 = b-wire

Necessary height units for 19-inch cabinet assembly: 1
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 4-39 Patch Panel S30807-K6143-X

4.2.7.2.1 Installing the Patch Panel in a 19-Inch Cabinet

Installation procedure

> ⚠ **Caution**
> The patch panel must be installed above the system cabinet.
> A minimum of one height unit must be kept clear above the cabinet to guarantee sufficient ventilation of the system cabinet. This is achieved by the gray plastic cover fixed to the top of the system cabinets. Never remove this plastic cover.

Insert the patch panel (A, in Figure 4-40) above the system cabinet and secure it to the 19-inch frame on both the left and the right using two screws on each side.

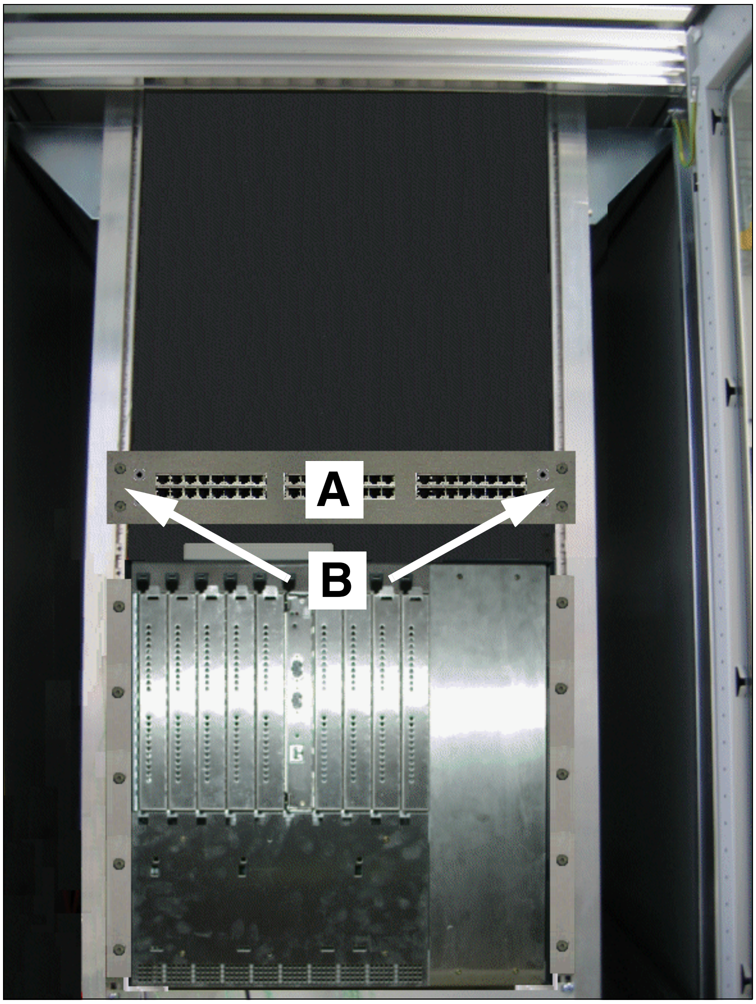


Figure 4-40 Installing the External Patch Panel in the 19-Inch Cabinet

4.2.7.2.2 Connecting the Line Network to the External Patch Panel

Danger
Be sure to connect the main protective earthing terminal on all system cabinets and all patch panels to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).

Telephones and trunks are connected directly to the MW8 jack on the front of the patch panel. Information on MW8 jack assignment on the front of the patch panel is provided in the board descriptions (in the “Cable and Connector Assignment” table) in Chapter 3.

Surge protector

To divert surges caused by lightning, insert surge protectors on

- lines that leave the system buildings (outside stations)
- lines > 500 m long.

Connect the polarized surge protectors to the plugging locations F1 to F8 provided on the patch panel (see Figure 4-42).

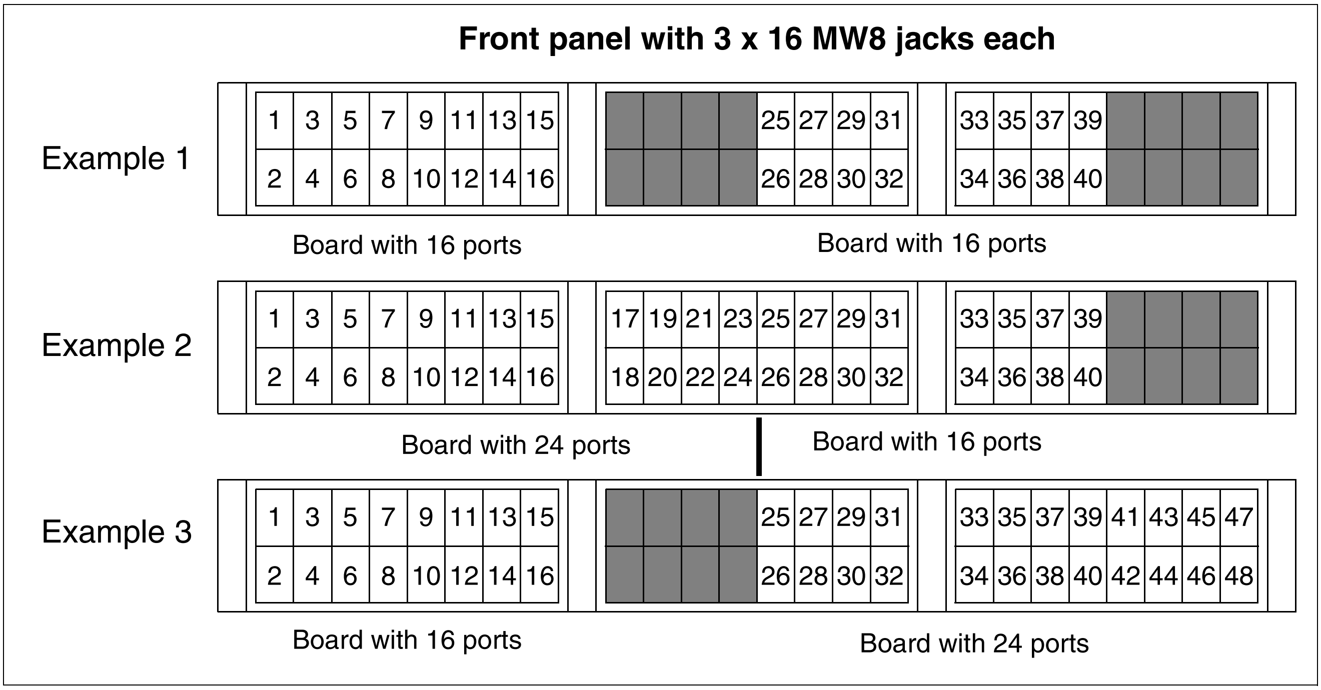
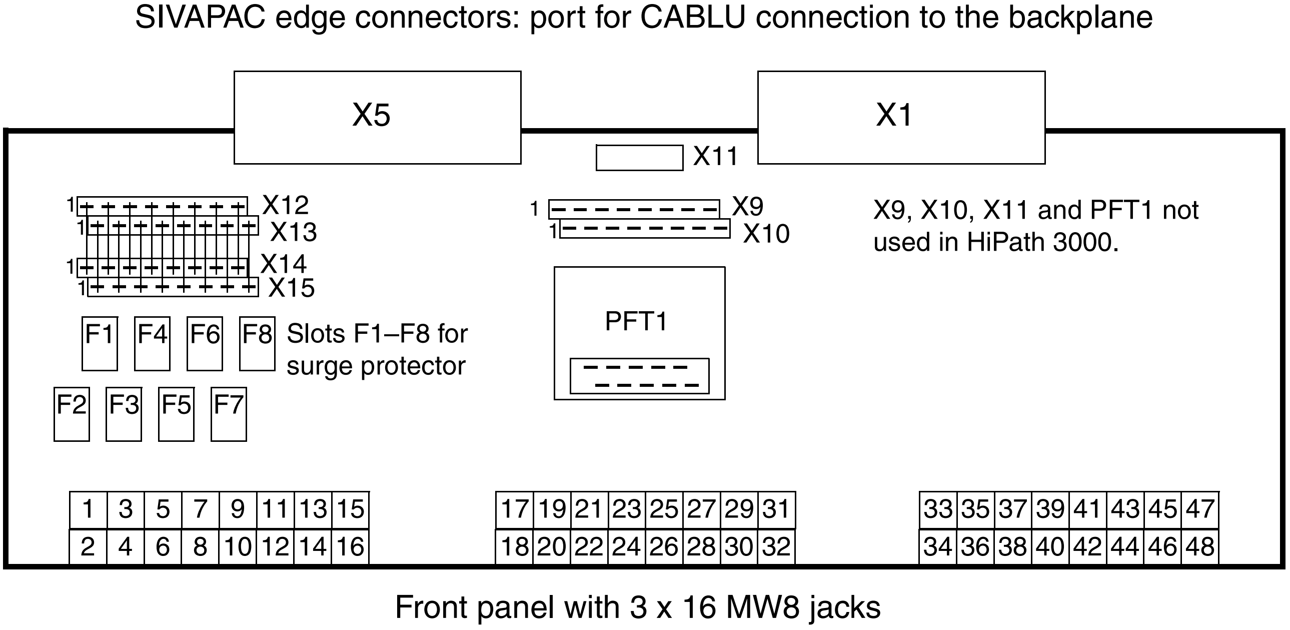

Front panel with 3 x 16 MW8 jacks each
Example 1
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
25 27 29 31
26 28 30 32
33 35 37 39
34 36 38 40
Board with 16 ports
Board with 16 ports
Example 2
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
17 19 21 23 25 27 29 31
18 20 22 24 26 28 30 32
33 35 37 39
34 36 38 40
Board with 24 ports
Board with 16 ports
Example 3
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
25 27 29 31
26 28 30 32
33 35 37 39 41 43 45 47
34 36 38 40 42 44 46 48
Board with 16 ports
Board with 24 ports

Figure 4-41 Layout of the Patch Panel S30807-K6143-X for Different Peripheral Boards


SIVAPAC edge connectors: port for CABLU connection to the backplane
X5
X1
X11
X12
X13
X14
X15
1
X9
X10
X9, X10, X11 and PFT1 not used in HiPath 3000.
PFT1
F1
F4
F6
F8
Slots F1–F8 for surge protector
F2
F3
F5
F7
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
17 19 21 23 25 27 29 31
18 20 22 24 26 28 30 32
33 35 37 39 41 43 45 47
34 36 38 40 42 44 46 48
Front panel with 3 x 16 MW8 jacks

Options for connecting the external line network:

- Connection via the MW8 jacks on the front of the patch panels. Using jumper wire, bridges must be inserted between the terminal strips X12 and X14 and between X13 and X15. The contact between the connector X5 and the first eight MW8 jacks is only set up when wire bridges are present.
- Direct connector jumpering on the X12/X13 connector. Bridges are not necessary in this case.

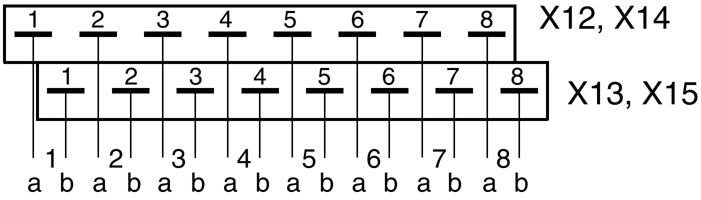
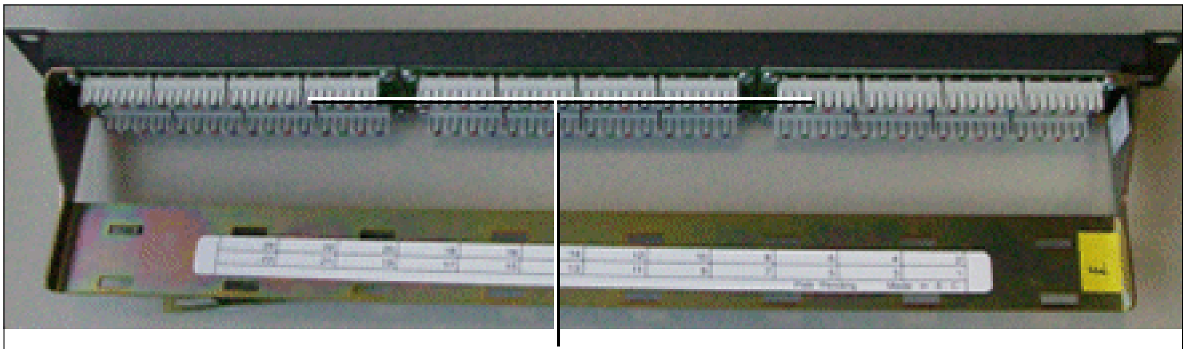

1 2 3 4 5 6 7 8
X12, X14
1 2 3 4 5 6 7 8
X13, X15
1 2 3 4 5 6 7 8
a b a b a b a b a b a b a b a b

Figure 4-42 Assignment of Patch Panel S30807-K6143-X

4.2.7.3 Inserting External S_0 Patch Panel C39104-Z7001-B3

Structure

All incoming cables must be attached to the patch panel using cable ties.



Necessary height units for 19-inch cabinet assembly: 1
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 4-43 S_0 Patch Panel C39104-Z7001-B3

4.2.7.3.1 Installing the S_0 Patch Panel in the 19-Inch Cabinet

Installation Procedure

> ⚠ **Caution**
> The patch panel must be installed above the system cabinet.
> A minimum of one height unit must be kept clear above the cabinet to guarantee sufficient ventilation of the system cabinet. This is achieved by the gray plastic cover fixed to the top of the system cabinets. Never remove this plastic cover.

Insert the S_0 patch panel (A, in Figure 4-44) above a system cabinet and secure it to the 19-inch frame on both the left and the right using two screws (B) on each side.

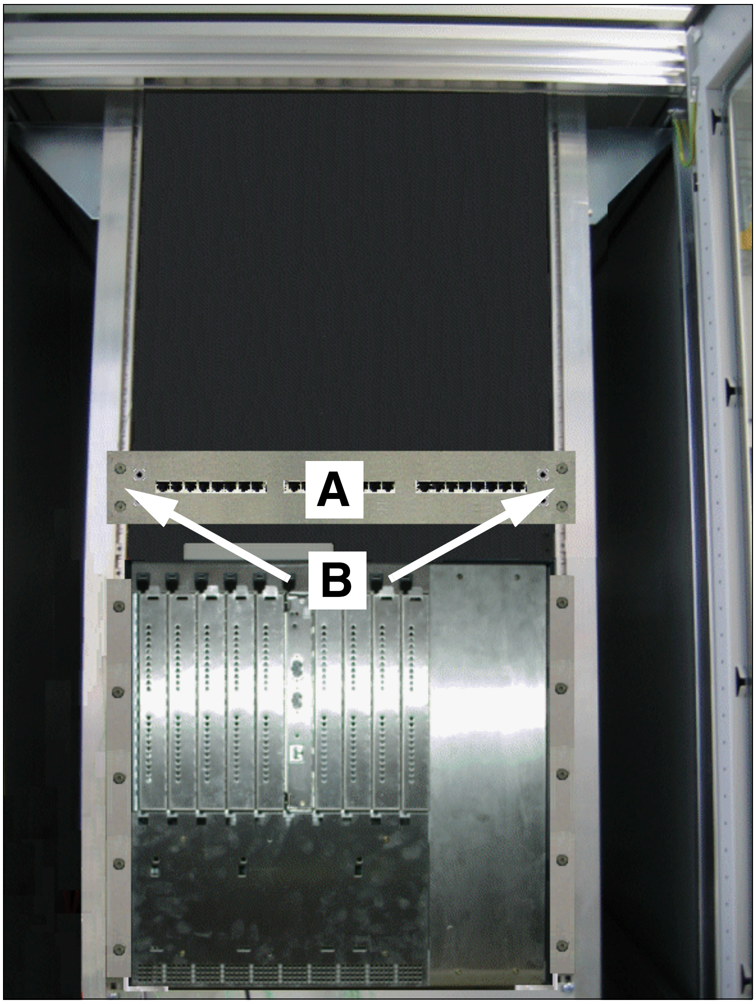
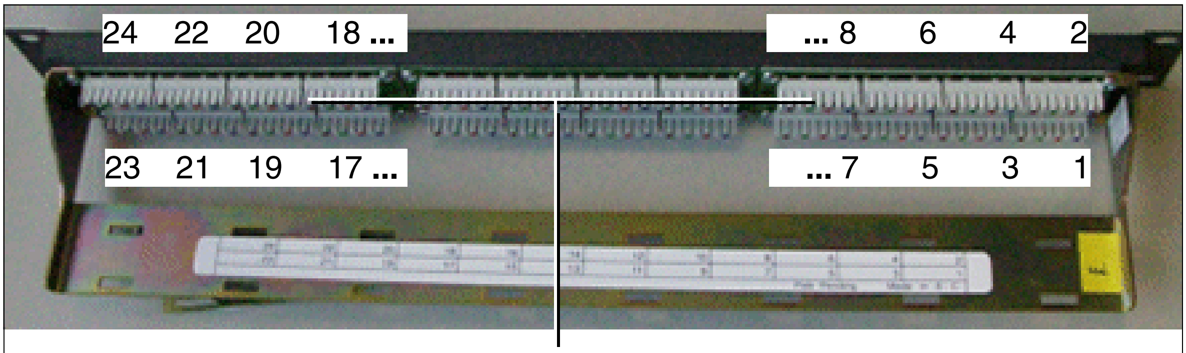
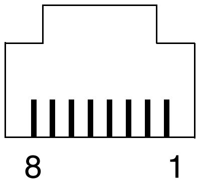


Figure 4-44 Installing the External S_0 Patch Panel in the 19-Inch Cabinet

4.2.7.3.2 Connecting Lines to the External S_0 Patch Panel



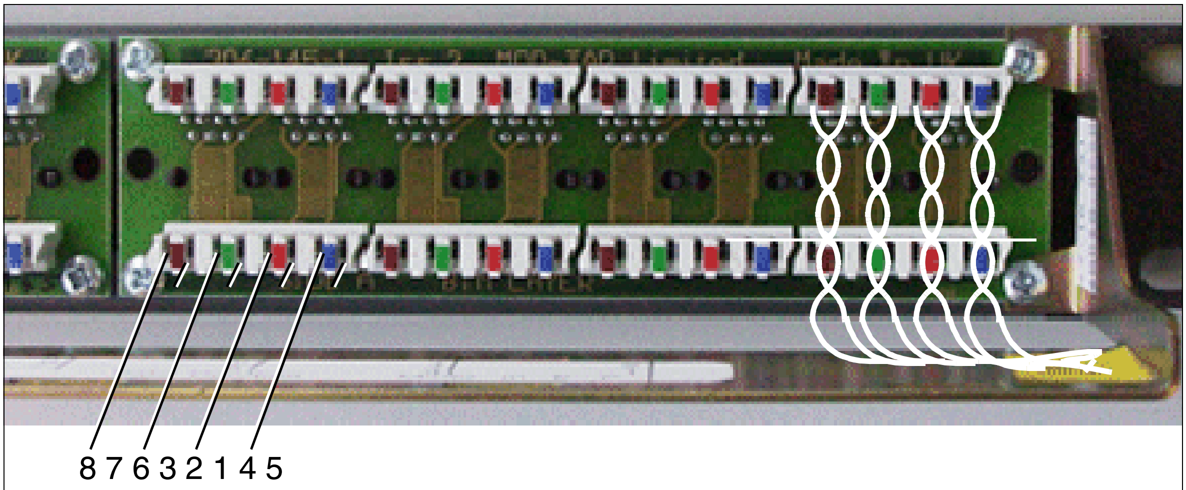


MW8 jack assignment:

Pin	**as a subscriber line**	**as a trunk connection**
3	Transmit +	Receive +
4	Receive +	Transmit +
5	Receive –	Transmit –
6	Transmit –	Receive –

Figure 4-45 Assignment of the S_0 Patch Panel C39104-Z7001-B3

CABLUs must be manually connected to the S_0 patch panel (Figure 4-46). You can use the Krone wiring tool for this.

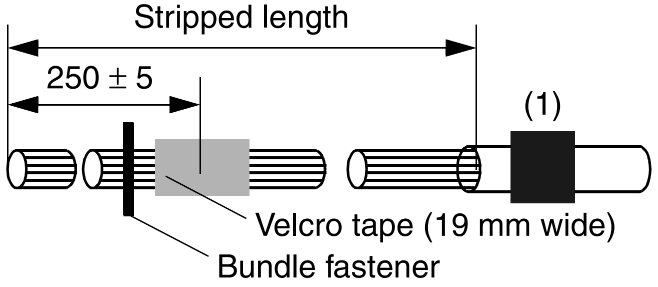


Pin assignment of MW8 jacks

Twist the wire pairs before laying them.

Figure 4-46 Laying Wire Pairs at the S_0 Patch Panel

Stripping the open-end cable for the S_0 patch panel


Stripped length
250 ± 5
(1)
Velcro tape (19 mm wide)
Bundle fastener

Cable with film sheath: No. 6 (conductive copper tape) 1.5 windings. Ground wire shortened to 25 mm and soldered onto conductive tape (1).

Stripped length = 600 mm ± 5 mm

Figure 4-47 Stripping the Open-End Cable for the S_0 Patch Panel

The color codes for open-end cables are provided in Table 4-8.

4.2.7.4 For U.S. only: Connecting Network Facilities

DANGER
Ground the system properly before connecting the stations.

Connecting to the Point of Demarcation

Most main distribution frames are designed with a network demarcation block. You must cross-connect the MDF to the incoming trunks. Use a standard wiring tool for laying the cable wires.

Connecting to T1, PRI, or CorNet

Caution
The TMST2 Module can only be installed in conjunction with a listed channel service unit CSU.

Secondary Protection

DANGER
To protect against surge voltage caused by lightning, the following boards require secondary protection when their lines leave the building where the main distribution frame is housed:

- DIU2U*
- SLMA / SLMA8
- TMC16
- TMDID
- TMEW2
- TM2LP

* When this module is connected to the public network, secondary protection must be provided by the CSU.

4.2.8 Loading the System Software and Installing Subboards on the CBSAP

⚠ **Caution**
Always wear an antistatic wristband when working on the system (especially when handling boards). Connect the wristband to the slide-in shelf in the cabinet using the alligator clip.

The boards should be installed in the cabinets as described in Section 4.2.5.

The central control boards are not always fully equipped when delivered. Optional plug-in boards are packaged individually.

See Section 3.2.4 for information on slots for subboards on the central control board CBSAP.

⚠ **Caution**
Place the central control board on a flat surface before installing subboards.
The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-6).
Otherwise you may damage the board.

4.2.9 Connecting Workpoint Clients

Refer to Chapter 10 for details.

4.2.10 Making Trunk and Networking Connections

Refer to the following board descriptions for information:

- DIUN2 (S_{2M})
- STMD3 (S_0)
- STMI2 (IP)
- TM2LP (MSI)
- TMEW2 (E&M)
- DIU2U (For U.S. Only)
- TMC16 (U.S. Only)
- TMDID (for U.S. only)

4.2.11 Performing a Visual Inspection

Introduction

Before starting up the system, you must perform a visual inspection of the hardware, cables, and the power supply. The procedure is shown in Table 4-9. The visual inspection must be performed while the system is disconnected from the power supply.

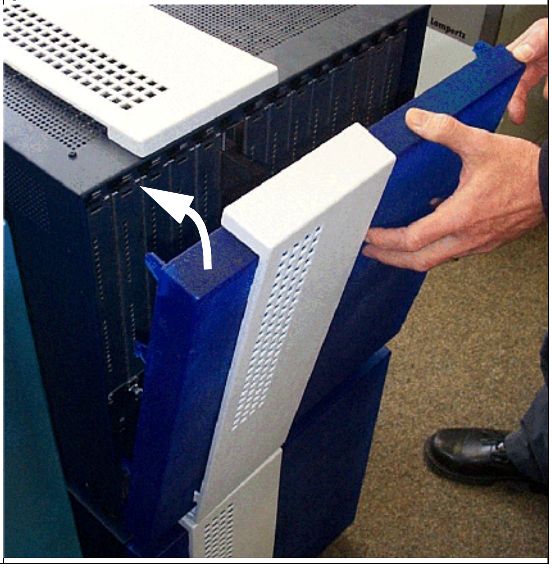
⚠ **Caution**
Before beginning work, make sure that the system is grounded and disconnected from the power supply.
Observe the measures for protecting electrostatically sensitive devices (see Page 1-9).

Visual Inspection Procedure

Table 4-9 Visual Inspection Procedure

Step	Activity	Resources/ Remarks	Action
1.	Compare the slots of the available boards with the component mounting diagram.	Board assignment map	If necessary, correct the board configuration and notify the sales department.
2.	Check that all boards are secure.	See Page 4-34	If necessary, plug the boards in again.
3.	Check that a shielding cover has been attached for all boards with no connection options in the front cover.		If necessary, replace missing shielding covers (refer to Page 4-35).
4.	Check whether the slots for LUNA2 and for REALS (basic cabinet only) are covered by an outer panel.		If necessary, attach the outer panel (see Page 4-36).
5.	Check whether all system cabinets have been sealed at the rear with the connection and filler panels provided.		Get additional connection and filler panels where required.

Table 4-9 Visual Inspection Procedure

Step	Activity	Resources/ Remarks	Action
6.	Check whether a separate grounding is connected to the main grounding terminals of all system cabinets.		If necessary, ground the system as described in the following sections: ● Section 4.2.3.4, for installing the standalone HiPath 3800 ● Section 4.2.4.4, for installing the HiPath 3800 in the 19-inch cabinet.
7.	Check the local supply voltage.	Digital multimeter	
8.	Only for installing HiPath 3800 as a standalone system: close all system cabinets with the front and back plastic covers provided.		Fit the cover into the guides and press down on the cover unit it snaps into place. 

After finishing the visual inspection, you can begin starting up the HiPath 3800 as described in Chapter 5.

4.3 Installing HiPath 3750, HiPath 3700

4.3.1 Installation Prerequisites

> ⚠ **Warning**
> Only authorized service personnel should install and start up the system.

Tools and resources needed

The following are needed for installing the HiPath 3750 and HiPath 3700 system:

- **Tools**:
  - Hex or open-end wrench, 8 mm
  - Diagonal cutting pliers, telephone pliers, wire stripper, flat-nosed pliers
  - Slotted screwdrivers, from 2 to 8 mm (1/4 to 5/16 in.)
  - Phillips or cross-point screwdrivers, sizes 1 and 2
  - TORX screwdriver
  - Wire stripper (for example, from Krone)
  - Electric drill, hammer
  - Level, tape measure
  - For U.S. only: Punch-down tool suitable for the block used (such as block 66)
- **Resources**:
  - Assistant T or HiPath 3000 Manager E
  - Digital multimeter for testing ground connections and partial voltages
  - Telephone test set for analog interfaces
  - Not for U.S.: ISDN tester (such as K3000 or Aurora)
  - For U.S. only: Aurora$^{\text{Duet}}$, Aurora$^{\text{Expert,}}$ Aurora$^{\text{Remote}}$ or similar, ISDN protocol analyzer

4.3.2 Installation Procedure

Table 4-10 HiPath 3750, HiPath 3700 - System Installation Procedure

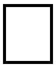
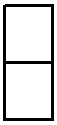
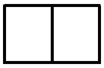
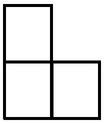
Step	Installation Activity	
	Installing HiPath 3750	**Installing HiPath 3700 (19-Inch Cabinet)**
1.	Selecting the Installation Site, page 4-87 (usually predetermined)	Selecting the Installation Site, page 4-128 (generally determined by the existing 19-inch cabinet)
2.	Unpacking the Components, page 4-89	Unpacking the Components, page 4-128
3.	Install MDFU or MDFU-E (not for USA), page 4-90	Mounting the System Cabinet in the 19-Inch Cabinet, page 4-129
4.	Setting up the System Cabinets (from Page 4-91): Single Cabinet  Two cabinets (stacked)  Two cabinets (side by side)  Three cabinets (stacked) 	Mounting the Patch Panel in the 19-Inch Cabinet, page 4-133
5.	Grounding the System, page 4-106 Checking the Grounding, page 4-111	Grounding the System, page 4-134 Checking the Grounding, page 4-136
6.	Connecting the Cable to the Backplane, page 4-112	Connecting the Cable to the Backplane, page 4-137
7.	Laying the Line Network and Setting Jumpers on the MDFU or MDFU-E, page 4-122	Connecting the Line Network to the Patch Panel, page 4-150
8.	Loading the System Software and Installing Subboards on the CBCPR, page 4-151	
9.	Configuration notes, page 4-152 (cabinet(s) are already equipped with the boards)	
10.	Connecting Workpoint Clients, page 4-161	

Table 4-10 HiPath 3750, HiPath 3700 - System Installation Procedure

Step	**Installation Activity**	
	Installing HiPath 3750	**Installing HiPath 3700 (19-Inch Cabinet)**
11.	Making trunk connections, page 4-161	
12.	Performing a Visual Inspection, page 4-162	

4.3.3 Installing HiPath 3750

This section contains information on how to install the HiPath 3750 communication system. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment and expansions.

Information on

- the possible equipment of central boards with optional plug-in boards
- board configuration
- final visual inspection

applies to both HiPath 3750 and HiPath 3700 and is described starting in Section 4.3.5.

4.3.3.1 Selecting the Installation Site

Selecting a site

The customer usually has a preferred installation site in mind.

Make sure that the customer’s site meets the following guidelines:

- To guarantee sufficient system ventilation, allow a minimum of 10 cm clearance in front of and behind the housing.
- Do not expose the systems to direct sources of heat (for example sunlight and heaters).
- Do not expose the systems to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.9.

For U.S. Only:

- Install secondary-protection equipment.
- Avoid standard carpeting, as it tends to produce electrostatic charges.
- Ensure the availability of a power source that meets the requirements described in Section 4.3.3.1.1.
- Ensure that Siemens equipment is 40 in. (101.6 cm) from other electrical equipment. The National Electrical Code (NEC) requires 36 in. (91.44 cm) of clearance in front of electrical equipment and 40 in. (101.6 cm) of clearance from other electrical service equipment.
- The equipment room for the system should provide adequate space for installation and maintenance activities (such as removing and replacing boards). Leave at least 16 in. (42 cm) on all sides of the system, and 36 in. (16 cm) in front.

Information on the design of the HiPath 3750 can be found in Section 2.2.2.2.

4.3.3.1.1 For U.S. only: AC outlet

An AC connection is required for each cabinet. The AC connection must fulfill the requirements specified in Table 4-11.

Table 4-11 Electrical Connection Values (for U.S. only)

Nominal voltage	**Nominal voltage range**		**Nominal Frequency Range**		**Wall Outlet Configurations**
	from	**to**	**from**	**to**	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

⚠ **WARNING**
Never connect a HiPath 3750system or a combination of HiPath 3750systems directly to a wall socket. Use a UL-listed or CSA-certified surge protector for every two cabinets.

AC Power Outlet Requirements

- A UL-listed or CSA-certified surge protector must be connected between the socket and the system. Two cabinets can be connected to each surge protector. Never connect a HiPath 3750system or a combination of systems directly to a wall socket.
- The power source may not be more than 2.4 m (8 ft.) from the system.
- The power source must provide 120 V AC (single-phase, fused) power at 50-60 Hz and 20 A.
- A warning should be attached to the circuit breaker to prevent accidental removal of power.
- An independent electric circuit with an isolated ground conductor should be used.

The system must be properly grounded before startup (see description in Section 4.3.3.5).

4.3.3.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.

⚠ **Caution**
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.3.3.3 Install MDFU or MDFU-E (not for USA)

Introduction

The following are used as main distribution frames:

- MDFU-E, which is shipped with new systems (see Figure 4-71).
- the MDFU (one MDFU unit per system cabinet), which was used for Hicom 150 E OfficePro in Release 2.0 and earlier (see Figure 4-70).

Installation notes

The main distribution frame should be installed in the direct vicinity of the system (note length of connection cable) and at eye level. Mount it on the wall according to the instructions that came with it. The bag attached to the cover contains a drill template. It also contains the necessary screws and wall anchors for attaching the MDF to the wall.

Procedure for wall mounting

Step	Activity
1.	Use the template to drill holes.
2.	Insert the wall anchors and screw in the screws, leaving 5 mm projecting.
3.	Remove the housing cover. Attach the main distributor frame to the brackets and remove the packing protection covering.
4.	Tighten the screws through the holes.

4.3.3.4 Setting up the System Cabinets

⚠ **Warning**
A fully equipped HiPath 3750 cabinet weighs 22 kg (48.46 lb). We recommend lifting cabinets only before they are equipped. Do not attempt to lift objects that you think are too heavy for you; use a hand truck or get assistance.

Introduction

Cabinets are supplied fitted with the specific boards required by the customer.

⚠ **Danger**
Be sure to ground the system properly before starting it up and connecting the stations.

4.3.3.4.1 Overview

System configurations

The following setup options are possible for system cabinets:

System
One cabinet on a horizontal surface
One cabinet on a wall (for U.S. only)
Two cabinets stacked on a horizontal surface
Two cabinets stacked on a wall (for U.S. only)
Two cabinets side-by-side on a horizontal surface
Three cabinets on a horizontal surface (two stacked)

4.3.3.4.2 Removing the Cabinet Covers

How the covers are secured

The front cabinet cover (for board servicing) and the rear cabinet cover (for cable servicing) are each secured by two snap fasteners.

You can remove the upper and lower grills on both covers. This allows the cables to be routed to the MDFU or MDFU-E for example.

To replace a cover, position the snap fasteners in the two guides and press down on the cover until it snaps into place.

Procedure (Figure 4-48)

Step	Activity
1.	Insert a slotted screwdriver (with the blade vertical) into a recess (1).
2.	Carefully swing the handle of the screwdriver toward the center of the cabinet (2) until the fastener snaps out and the cover loosens.
3.	Then insert the screwdriver in the second recess (3), loosen its snap fastener.

Mounting the cover

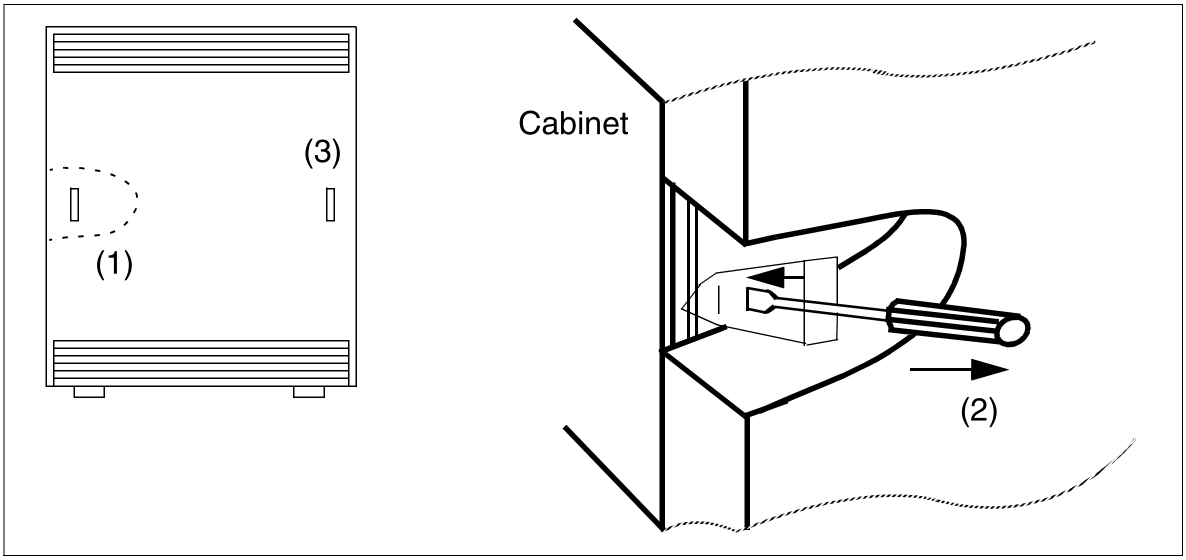


Figure 4-48 HiPath 3750 - Removing the Front and Rear Covers

4.3.3.4.3 Setting Up a Single Cabinet

Procedure

Step	Activity
1.	Remove the front and rear cover from the cabinet.
2.	Place the system cabinet in the installation site and make sure that it is level and stable.

4.3.3.4.4 Mounting a One-Cabinet System on the Wall (for U.S. only)

You can mount a one-cabinet system on the wall using the wall-mount kit.

Wall-Mount Kit

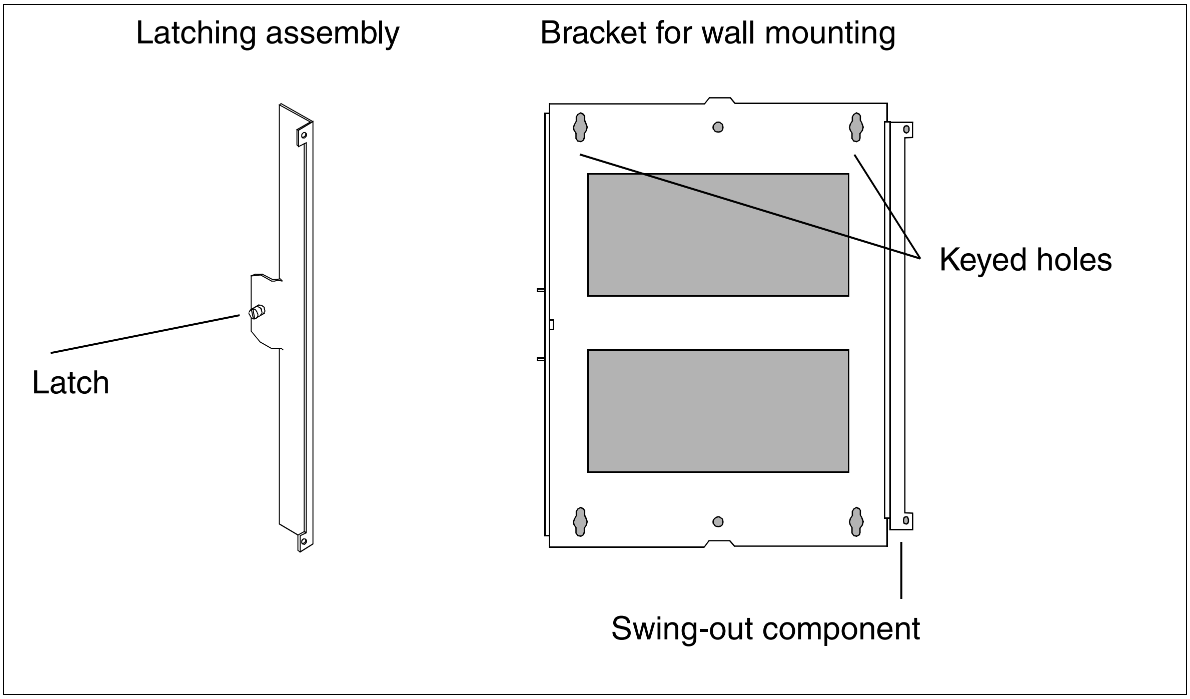

Latching assembly
Bracket for wall mounting
Keyed holes
Latch
Swing-out component

Figure 4-49 HiPath 3750 - Wall-Mount Kit (for U.S. only)

Procedure

Step	Activity
1.	Install a plywood backboard at least 0.75 in. (19.05 mm) thick.

Step	Activity
2.	Use the wall-mounting bracket as a template to drill three holes in the backboard. Use the keyed holes in the top of the bracket and the round hole in the bottom of the bracket.
3.	Install the screws in the top two holes, tightening them until 0.25 in. (6.35 mm) is protruding.
4.	Bolt the swing-out assembly on the wall-mounting bracket to the back of the cabinet.
5.	Close the swing-out assembly; Then mount the bracket and cabinet on the top screws.
6.	Swing the cabinet open and tighten the top screws completely.
7.	Insert and fully tighten the bottom screw in the round hole.
8.	Bolt the latching assembly to the opposite edge of the cabinet.

You can invert the bracket to have the cabinet swing out in the opposite direction.

⚠ **WARNING**
Do not fasten power cords to building surfaces when mounting cabinets on the wall.

Wall Mounting (One-Cabinet System)

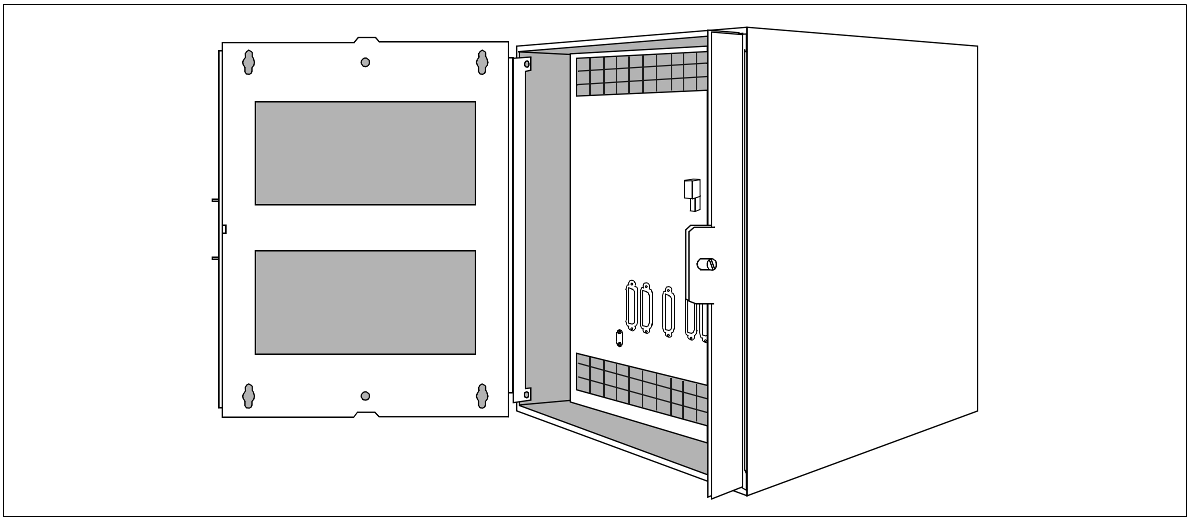


Figure 4-50 HiPath 3750 Mounting a One-Cabinet System on the Wall (for U.S. only)

4.3.3.4.5 Stacking Two Cabinets

Procedure

Step	Activity
1.	Remove the front and rear cabinet covers.
2.	Mount stabilizer feet on basic cabinet (BC). Place the basic cabinet in the installation site and make sure that it is level and stable.
3.	Place expansion cabinet (EC1) on basic cabinet. Insert the feet on EC1 into the depressions on the top of the BC.
4.	If mounting the system on the floor or on a table, attach the two cabinets using four connecting plates each held by two screws with washers (Figure 4-51). Make sure that the connecting plates are mounted in the correct direction (inside the cabinets and pointing inward).

⚠ **DANGER**
The connecting plates must be installed to ensure proper grounding for free-standing systems.

ℹ For U.S. only: You can install seismic anchors for greater stability, as is required in some installations. Additional information can be found in Section 4.3.3.4.9.
Take note that the bolts and inserts included in the seismic anchor kit are designed for concrete floors. Bolts for other surfaces must be requested or supplied separately.

Installing a two-cabinet system

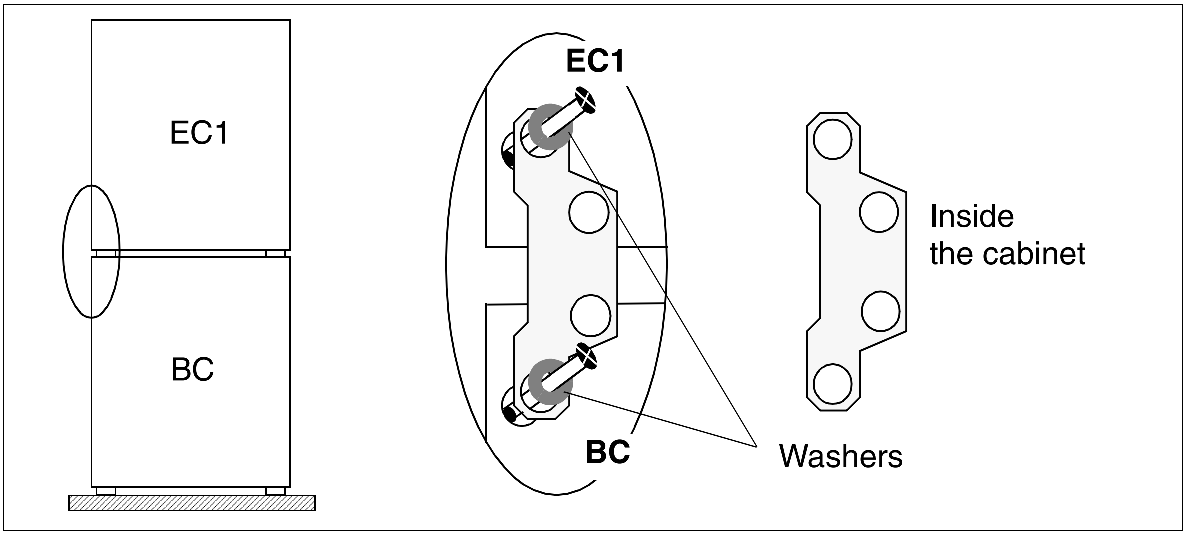


Figure 4-51 HiPath 3750 - Installing a Two-Cabinet System (Stacked)

Laying the Connecting Cables

To lay the connecting cables between the two cabinets, you can cut out the pre-stamped recesses in the bottom of EC1 and the top of the BC with a pair of diagonal cutting pliers and break them out with a pair of flat-nosed pliers.

⚠ **Caution**
Be careful when breaking out the recesses. Remove any sharp edges and corners.

Procedure: Fitting stabilizer feet

⚠ **Caution**
Always mount the stabilizer feet on stacked, surface-mounted system cabinets to ensure stability (Figure 4-52).

Step	Activity
1.	Place the stabilizer feet beneath the right and left outer edges of the cabinets. Insert the cabinet feet into the two holes in the stabilizer feet (1).
2.	Attach the stabilizer feet to the metal housing of the cabinet (2) by inserting two screws per foot into the pre-drilled holes in the housing.
3.	Continue installing the system.

Mounting the stabilizer feet

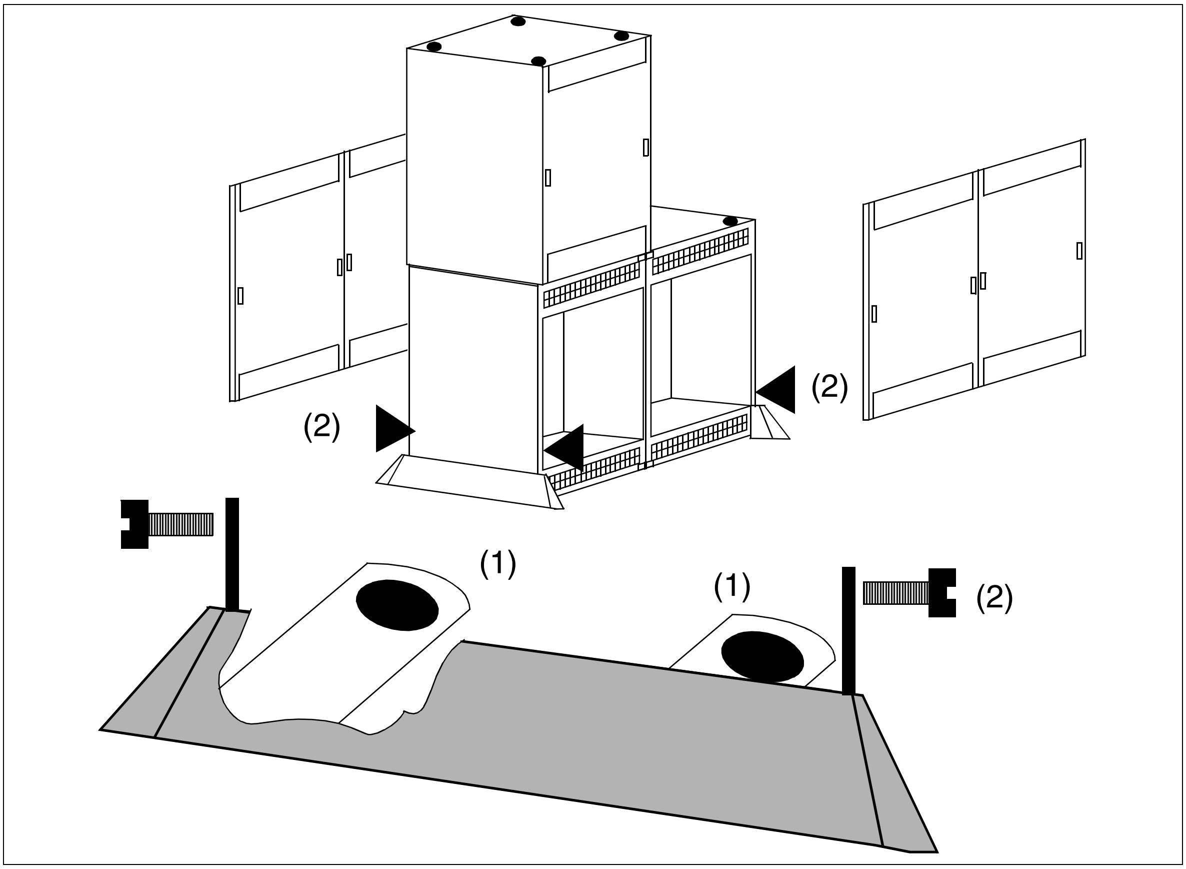


Figure 4-52 HiPath 3750 - Mounting the Stabilizer Feet (Three-Cabinet System Shown)

4.3.3.4.6 For U.S. only: Mounting Two Cabinets Stacked on the Wall

You can mount two cabinets stacked on the wall using the wall-mount kit.

⚠ **DANGER**
The second cabinet also requires an earth ground as described on Section 4.3.3.5.2. Do not fasten wall-mounted cabinets with the connecting plates, as this will interfere with the earth ground.

Wall-Mount Kit

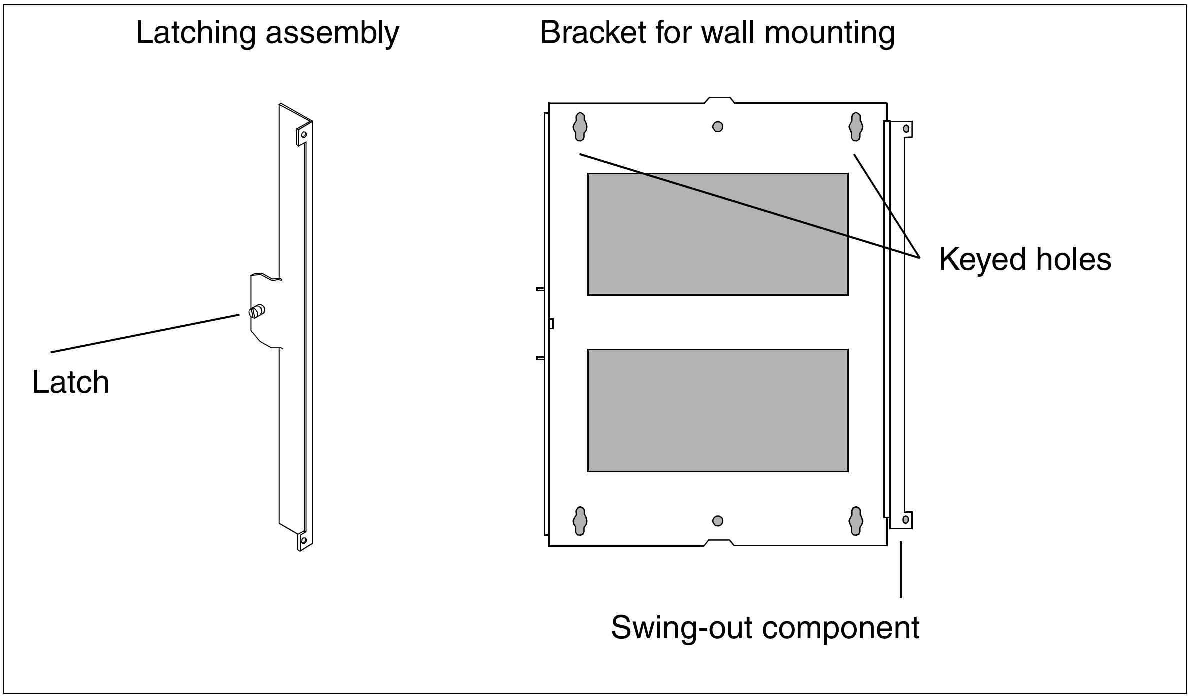


Figure 4-53 HiPath 3750 - Wall-Mount Kit (for U.S. only)

Procedure

Step	Activity
1.	Install a plywood backboard at least 0.75 in. (19.05 mm) thick.
2.	Use the wall-mounting bracket as a template to drill three holes in the backboard. Use the keyed holes in the top of the bracket and the round hole in the bottom of the bracket.
3.	Install the screws in the top two holes for each bracket, tightening them until 0.25 in. (6.35 mm) is protruding.

Step	Activity
4.	Bolt the swing-out assembly on the wall-mounting bracket to the back of each cabinet.
5.	Close the swing-out assembly; Close the swing-out assembly and hang each bracket and cabinet on the top screws.
6.	Swing the cabinet open and tighten the top screws completely.
7.	Insert and fully tighten the bottom screws in the round holes.
8.	Bolt the latching assembly to the opposite edge of each cabinet.

You can invert the wall brackets to have the cabinets swing out in the opposite direction.

⚠ **Warning**
Do not fasten power cords to building surfaces when mounting cabinets on the wall.

Wall Mounting (Stacked Two-cabinet System)

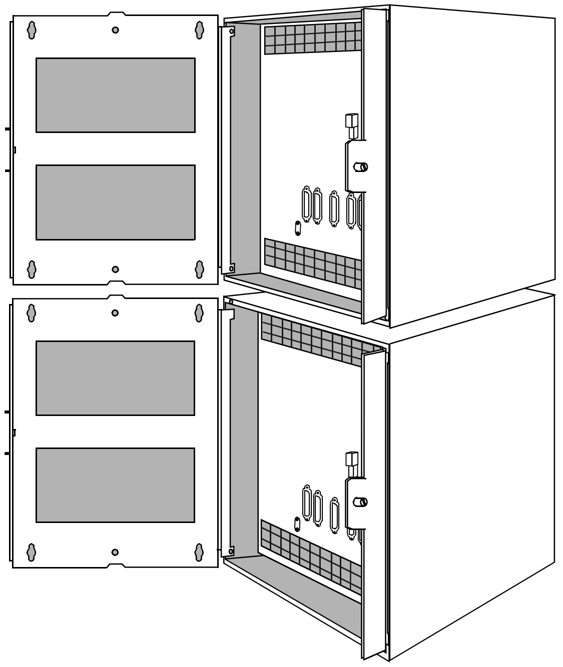


Figure 4-54 HiPath 3750 Wall Mounting for a Stacked Two-Cabinet System (for U.S. only)

Laying the Connecting Cables

To lay the connecting cables between the two cabinets, you can cut out the pre-stamped recesses in the bottom of EC1 and the top of the BC with a pair of diagonal cutting pliers and break them out with a pair of flat-nosed pliers.

⚠	**Warning** Be careful when breaking out the recesses. Remove any sharp edges and corners.

4.3.3.4.7 Setting Up a Two-Cabinet System Side by Side

Procedure

Step	Activity
1.	Remove the front and rear cabinet covers.
2.	Place the system cabinets side by side at the installation site and make sure that they are level and stable. Correct any differences in height.
3.	If mounting the system on the floor or on a table, attach the two cabinets using four connecting plates each held by two screws with washers (Figure 4-55). Make sure that the connecting plates are mounted in the correct direction (inside the cabinets and pointing inward).

⚠ **DANGER**
The connecting plates must be installed to ensure proper grounding for free-standing systems.

Installing a two-cabinet system

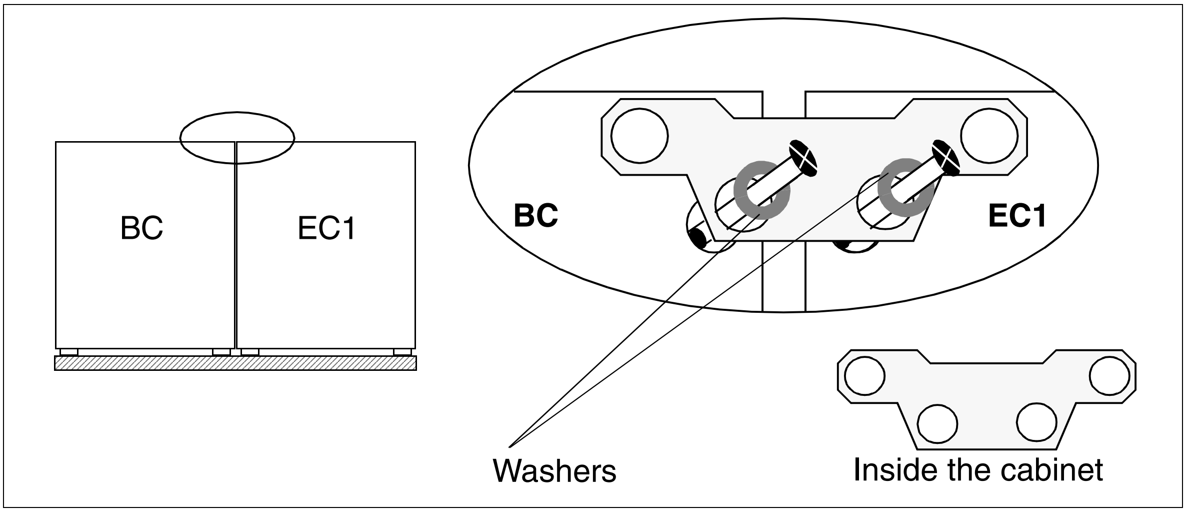


Figure 4-55 HiPath 3750 - Installing a Two-Cabinet System (Side By Side)

Laying the Connecting Cables

To lay the connection cables between the cabinets, first remove the lower grills in the rear covers.

4.3.3.4.8 Setting Up a Stacked Three-Cabinet System

⚠ **Caution**
Up to two cabinets can be stacked.

Procedure

Step	Activity
1.	Remove the front and rear cabinet covers.
2.	Mount one stabilizer foot on the basic cabinet and one on the expansion cabinet (EC2). Place EC2 next to the BC in the installation site and make sure that it is level and stable. Correct any differences in height.
3.	Place expansion cabinet (EC1) on basic cabinet. Insert the feet on EC1 into the depressions on the top of the BC.
4.	Attach the three cabinets using four connecting plates, each held by two screws with washers (Figure 4-56). Make sure that the connecting plates are mounted in the correct direction (inside the cabinets and pointing inward).

⚠ **DANGER**
The connecting plates must be installed to ensure proper grounding for free-standing systems.

ⓘ For U.S. only: You can install seismic anchors for greater stability, as is required in some installations. Additional information can be found in Section 4.3.3.4.9.
Take note that the bolts and inserts included in the seismic anchor kit are designed for concrete floors. Bolts for other surfaces must be requested or supplied separately.

Installing a three-cabinet system

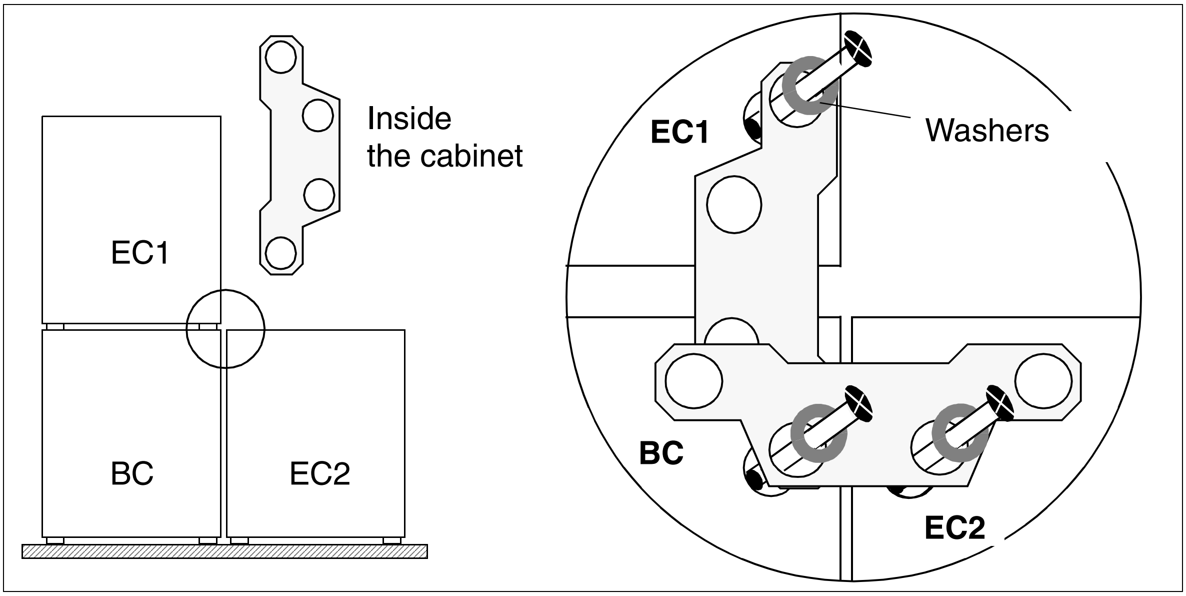


Figure 4-56 HiPath 3750 - Installing a Three-Cabinet System (Stacked)

Laying the Connecting Cables

- To lay the cables between the BC and EC2, remove the lower grills in the two rear covers.
- To lay the connection cables between stacked cabinets, you can cut out the pre-stamped recesses in the bottom of EC1 and the top of the BC with a pair of diagonal cutting pliers and break them out with a pair of flat-nosed pliers.

⚠ **Caution**
Be careful when breaking out the recesses. Remove any sharp edges and corners.

4.3.3.4.9 For U.S. only: Installing the Seismic Anchors

Seismic anchors can be used for additional stability if desired by the customer or required by code.

> Local building codes may require the use of seismic anchors in critical locations, such as hospitals. The HiPath 3750 seismic anchor kit includes bolts and attachments specially designed for concrete floors. If necessary, consult the location planner to check legal requirements or whether the customer requires seismic anchors for a different substrate.

Procedure

Step	Activity
1.	Hook the anchor into the center holes in the lower grill on each cabinet (front and back).
2.	Bolt the anchor to the floor using the holes provided.

The anchor for the back of the cabinets is wider to provide space for cables.

Seismic Anchoring

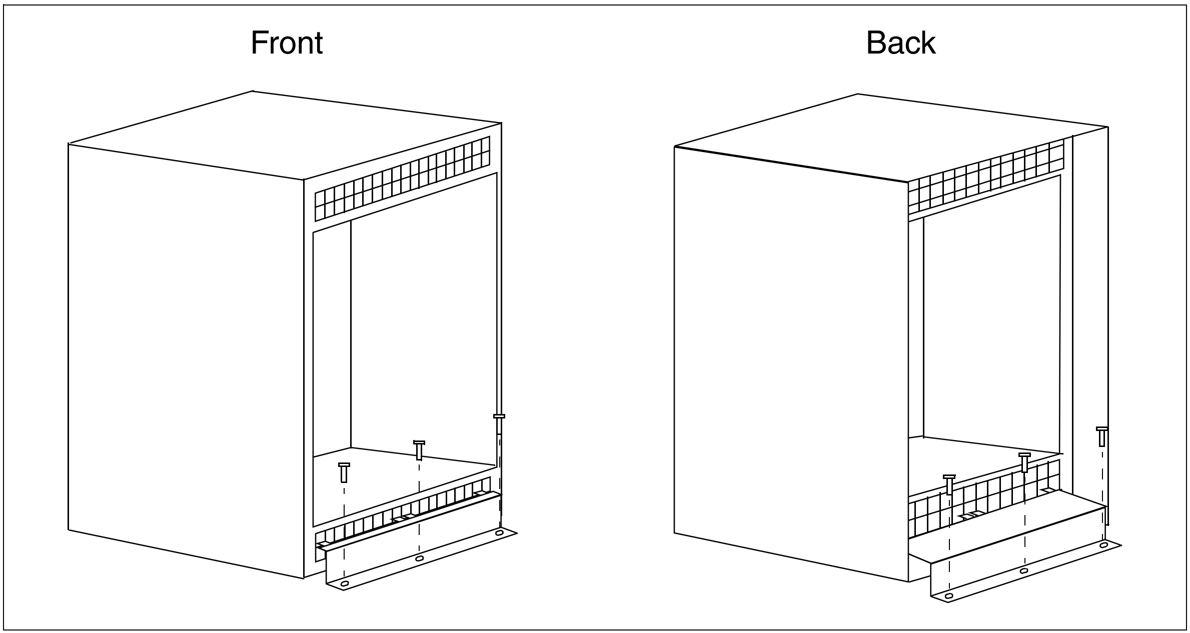


Figure 4-57 HiPath 3750 Seismic Anchors (for U.S. only)

Seismic Anchors for Multiple Cabinets

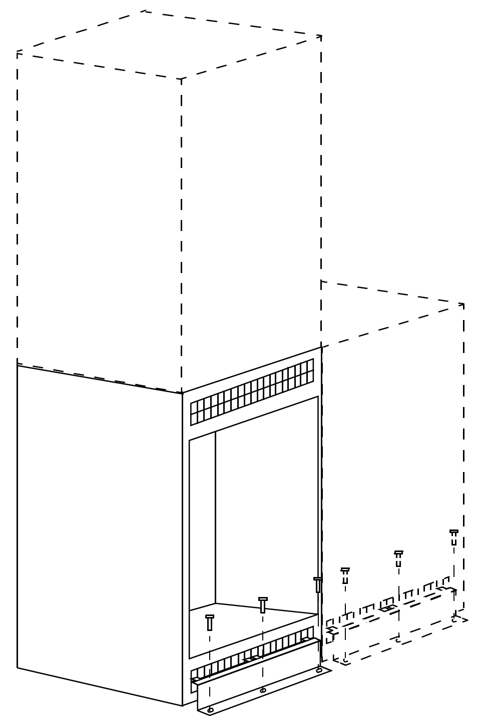


Figure 4-58 HiPath 3750 Seismic Anchoring for Multiple Cabinets (Front View) (for U.S. only)

4.3.3.5 Grounding the System

4.3.3.5.1 Not for U.S.: Grounding the System

Grounding: Grounding options

> ⚠ **Danger**
> The HiPath 3750 system and the MDFU or MDFU-E must be grounded as shown in Figure 4-59 by a separate ground conductor (minimum cross-section = 2.5 mm^2)
> Make sure that the ground conductor is securely installed and strain-relieved.
> Failure to follow these instructions can result in electrical shock.

If one or two ECs are required in addition to the BC, the four metal connecting plates must be installed to properly ground these cabinets.

The illustrations starting with Figure 4-60 show different grounding options.

> ⚠ **Danger**
> If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to ground the system separately using option 1b (Figure 4-61).

Note on possible ground loops

> To avoid ground loops from remotely operated devices (V.24 system peripherals), the devices should be connected to the same low-voltage network (sub-distribution board) if possible.
> If the building floor plan does not permit this, you may need a line driver to isolate the external devices in the event of a malfunction.

Grounding the system cabinets and main distribution frame

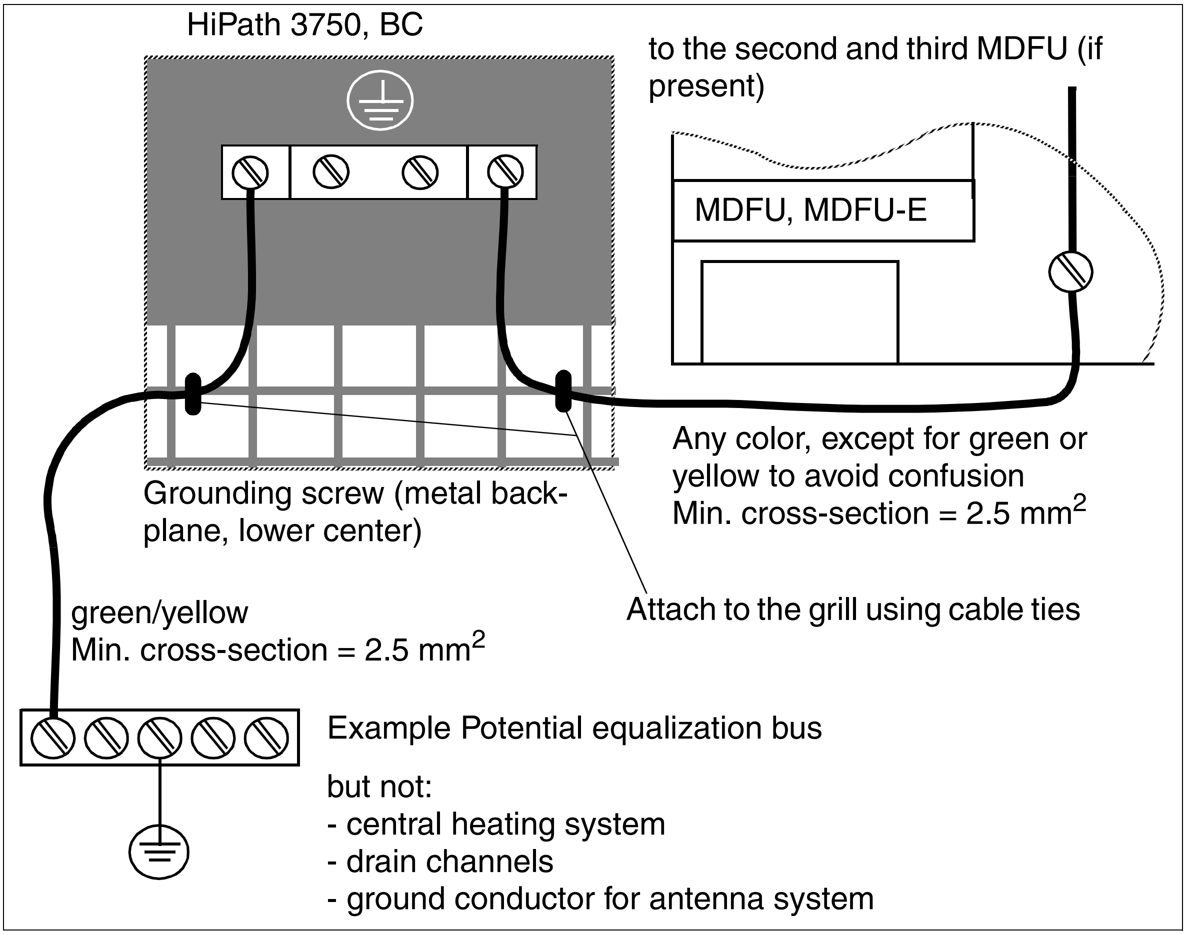

HiPath 3750, BC
to the second and third MDFU (if present)
MDFU, MDFU-E
Any color, except for green or yellow to avoid confusion
Min. cross-section = 2.5 mm^2
Grounding screw (metal back-plane, lower center)
green/yellow
Min. cross-section = 2.5 mm^2
Attach to the grill using cable ties
Example Potential equalization bus
but not:
- central heating system
- drain channels
- ground conductor for antenna system

Figure 4-59 HiPath 3750 - Grounding the System Cabinets and Main Distribution Frame (not for U.S.)

Grounding option 1a

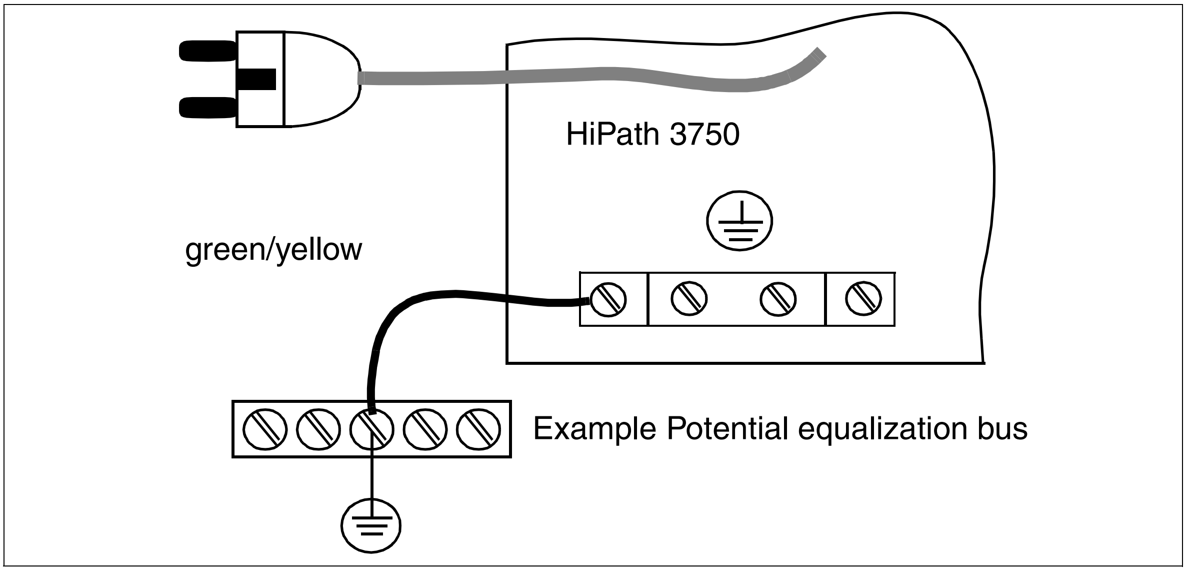

HiPath 3750
green/yellow
Example Potential equalization bus

Figure 4-60 HiPath 3750 - Grounding Option 1a (not for USA)

Grounding option 1b

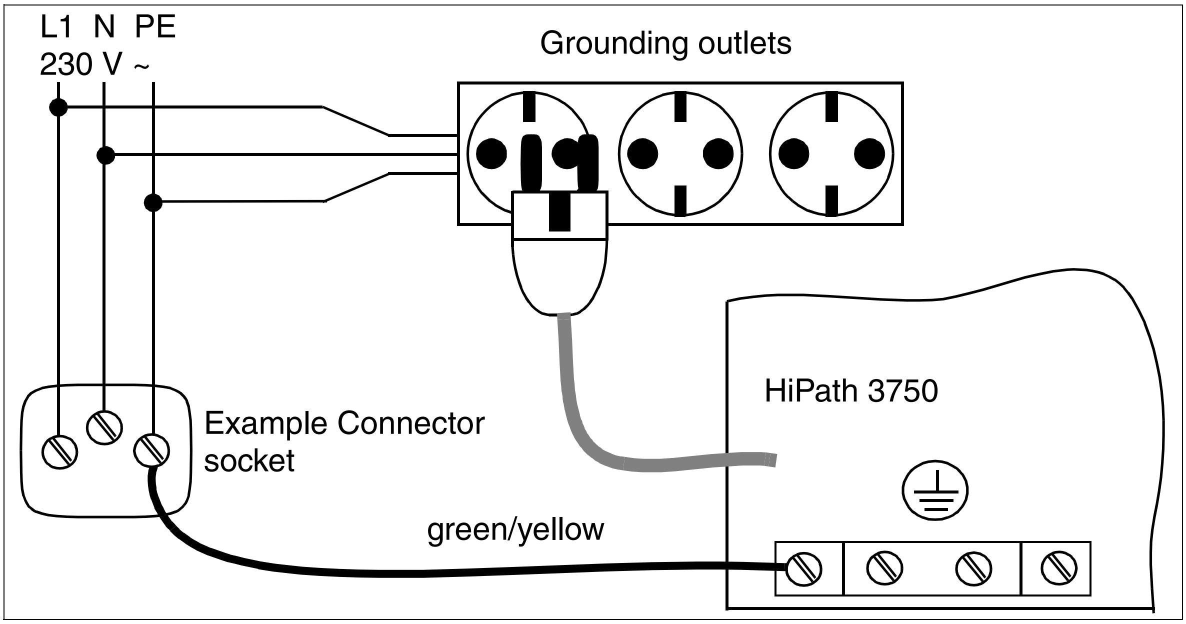

L1 N PE
230 V ~
Grounding outlets
HiPath 3750
Example Connector socket
green/yellow

Figure 4-61 HiPath 3750 - Grounding Option 1b (not for USA)

4.3.3.5.2 For U.S. only: Grounding the System

A connecting cable is used for grounding the system cabinets. The system must also be grounded by a separate ground conductor. Choose a ground connection with less than 2 ohms of resistance, such as:

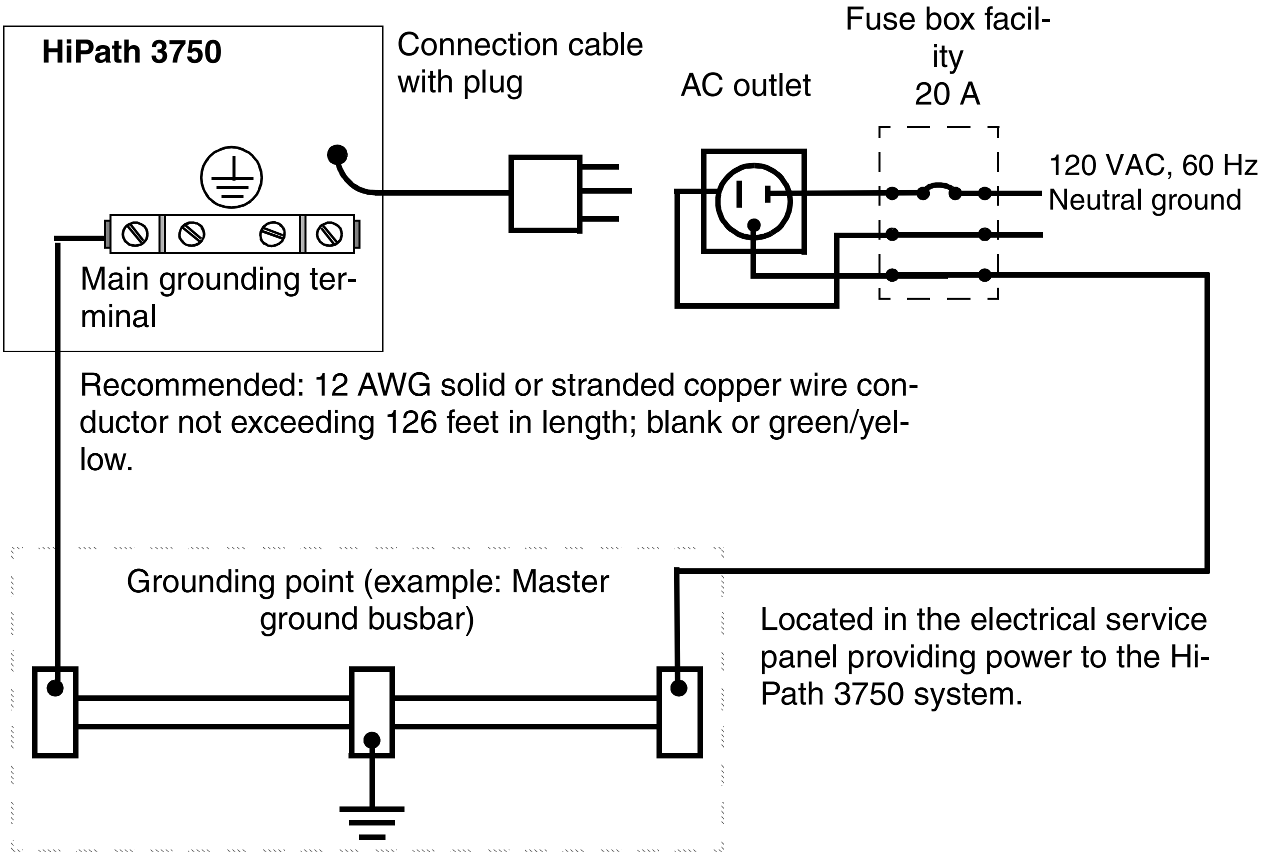
- Master ground busbar
- Ground field
- Copper ground rod

Run a separate earth ground conductor from the earth ground to the cabinet frame ground (located in the center of the bottom of the backplane). The minimum cross-section required is 12 AWG.

Figure 4-62 shows the safety conductor connectors for the basic cabinet

If one or two ECs are required in addition to the BC in a standalone system, the four metal connecting plates must be installed to properly ground these cabinets.

If two system cabinets are mounted on the wall, a separate grounding connector is also required for the expansion cabinet. Do not use the metal connecting plates on wall-mounted systems.


HiPath 3750
Connection cable with plug
AC outlet
Fuse box facility 20 A
120 VAC, 60 Hz
Neutral ground
Main grounding terminal
Recommended: 12 AWG solid or stranded copper wire conductor not exceeding 126 feet in length; blank or green/yellow.
Grounding point (example: Master ground busbar)
Located in the electrical service panel providing power to the HiPath 3750 system.

Note: Single-point ground (SPG) configuration shown.

⚠ **DANGER**
This wire installation must be completed by a qualified electrician and must comply with the national and local electrical codes.

Figure 4-62 HiPath 3750 - Grounding connector for Basic Cabinet (for U.S. only)

Grounding the Main Distribution Frame

Mount and ground the MDF in accordance with the manufacturer’s instructions.

4.3.3.6 Checking the Grounding

Procedure

Perform the tests in the table below to ensure that the system is properly grounded before startup.

Step	Activity	Target
1.	Check the ohmic resistance of the ground connection to the system: Perform measurement between the PE (protective earth) on a socket in the internal installation (at the system's installation site) and HiPath 3750. Prerequisites: ● HiPath 3750 is not yet connected to the low-voltage network via the power cable. ● The system's separate grounding is connected.	< 10 ohms
2.	Check the ohmic resistance between the individual system parts (basic cabinet, expansion cabinets, main distribution frame). Prerequisite: HiPath 3750 is not yet connected to the low-voltage network via the power cable.	< 1 ohm

4.3.3.7 Connecting the Cable to the Backplane

> All cables that leave the cabinet must be attached to the ventilation grill on the metal back panel using cable ties.

4.3.3.7.1 Backplanes on the “8-Slot” Cabinets

> The “8-slot” basic cabinet has seven slots, while the expansion cabinets each have eight slots for peripheral boards.

Backplane on the “8-slot” basic cabinet

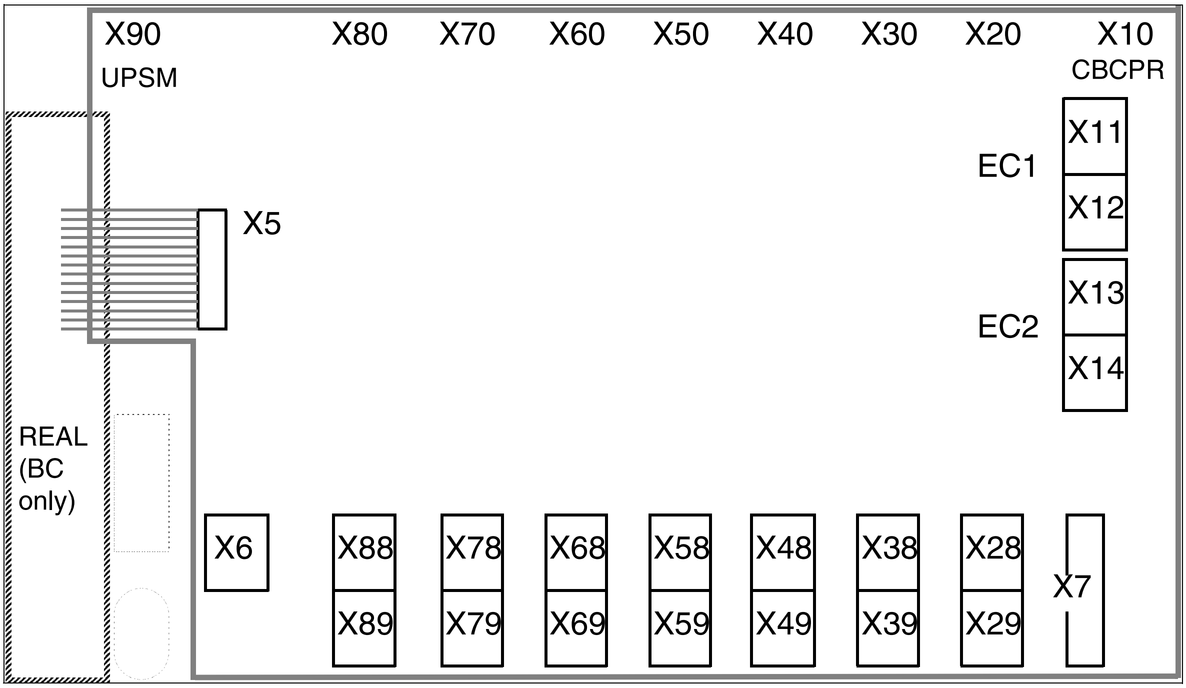

X90
UPSM
X80
X70
X60
X50
X40
X30
X20
X10
CBCPR
X11
EC1
X12
X5
X13
EC2
X14
REAL (BC only)
X6
X88
X89
X78
X79
X68
X69
X58
X59
X48
X49
X38
X39
X28
X29
X7

Figure 4-63 HiPath 3750 - Backplane on the “8-Slot” Basic Cabinet

Backplane on the “8-slot” expansion cabinets

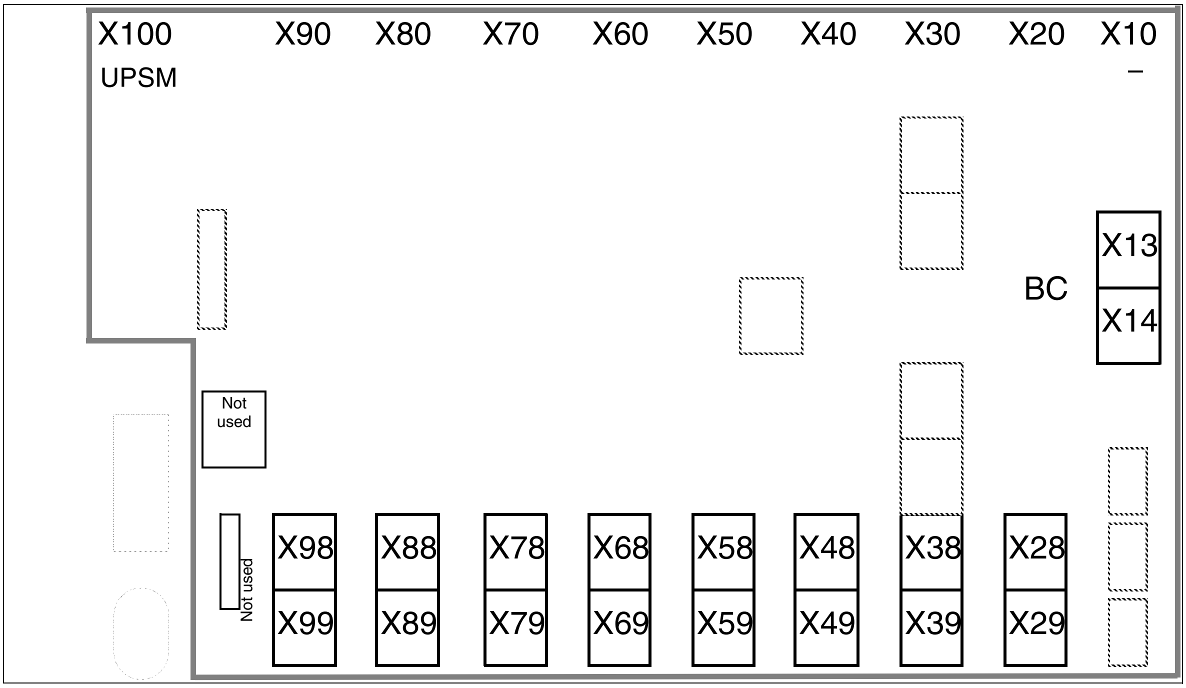

X100
UPSM
X90
X80
X70
X60
X50
X40
X30
X20
X10
–
X13
BC
X14
Not used
Not used
X98
X88
X78
X68
X58
X48
X38
X28
X99
X89
X79
X69
X59
X49
X39
X29

Figure 4-64 HiPath 3750 - Backplane on the “8-Slot” Expansion Cabinets

Jack Assignment on the “8-Slot” Backplane

Table 4-12 Jack Assignment on the “8-Slot” Backplane

Connector	Cabinet	Function
X7	BC	V.24 interface (no electrical isolation) via 25-pin jack: Connection for printer, Plus products, and other devices.
X5	BC	Cable connector to REAL
X6	BC	MDFU-to-REAL connection via SU connector
X11	BC	Cable connector to EC1: X13
X12	BC	Cable connector to EC1: X14
X13	BC EC1 EC2	Cable connector to EC2: X13 Cable connector to BC: X11 Cable connector to BC: X13
X14	BC EC1 EC2	Cable connector to EC2: X14 Cable connector to BC: X12 Cable connector to BC: X14
X28 - X88	All	1 SU connector each (16 TW) to MDFU or MDFU-E

Table 4-12 Jack Assignment on the “8-Slot” Backplane

Connec-tor	Cabinet	Function
X98	EC1 EC2	1 SU connector each (16 TW) to MDFU or MDFU-E
X29 - X89	All	1 SU connector each (8 TW) to MDFU or MDFU-E (not for S_{2M})
X99	EC1 EC2	1 SU connector each (8 TW) to MDFU or MDFU-E (not for S_{2M})

Connection cables between the “8-slot” basic and expansion cabinets

If installing a multi-cabinet system, you must also connect the cables between the BC and ECs.

If	Then
Two-cabinet System	Connect BC to EC1 = 2 cables (S30267-Z178-A13) (see Figure 4-65)
Three-cabinet System	• Connect BC to EC1 = 2 cables (S30267-Z178-A13) • Connect BC to EC2 = 2 cables (S30267-Z178-A13) (see Figure 4-66)

Two-Cabinet “8-Slot” System: Connection Cable (See Table 4-12)

Cabinet part numbers

- BC = S30777-U757-X
- EC1 = S30777-U708-X100

Backplane part numbers

- BC = S30777-Q757-X
- EC1 = S30777-Q708-X100

Connection cable part numbers

- For connecting BC to EC1 = S30267-Z178-A13

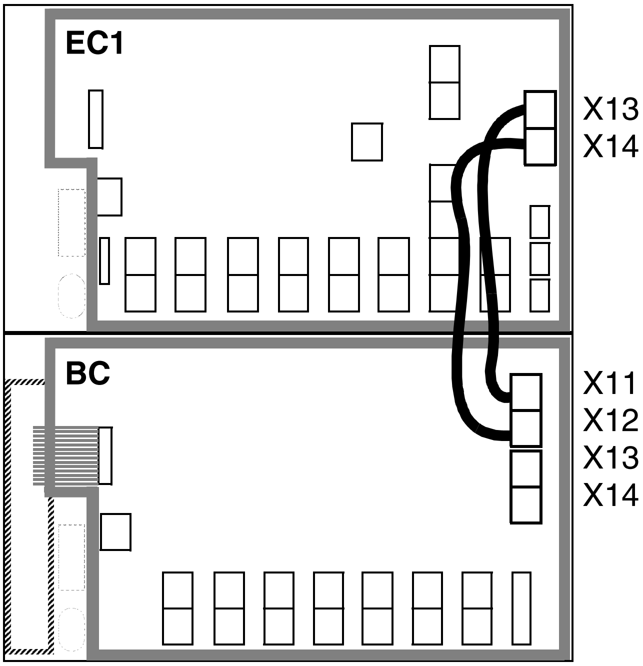
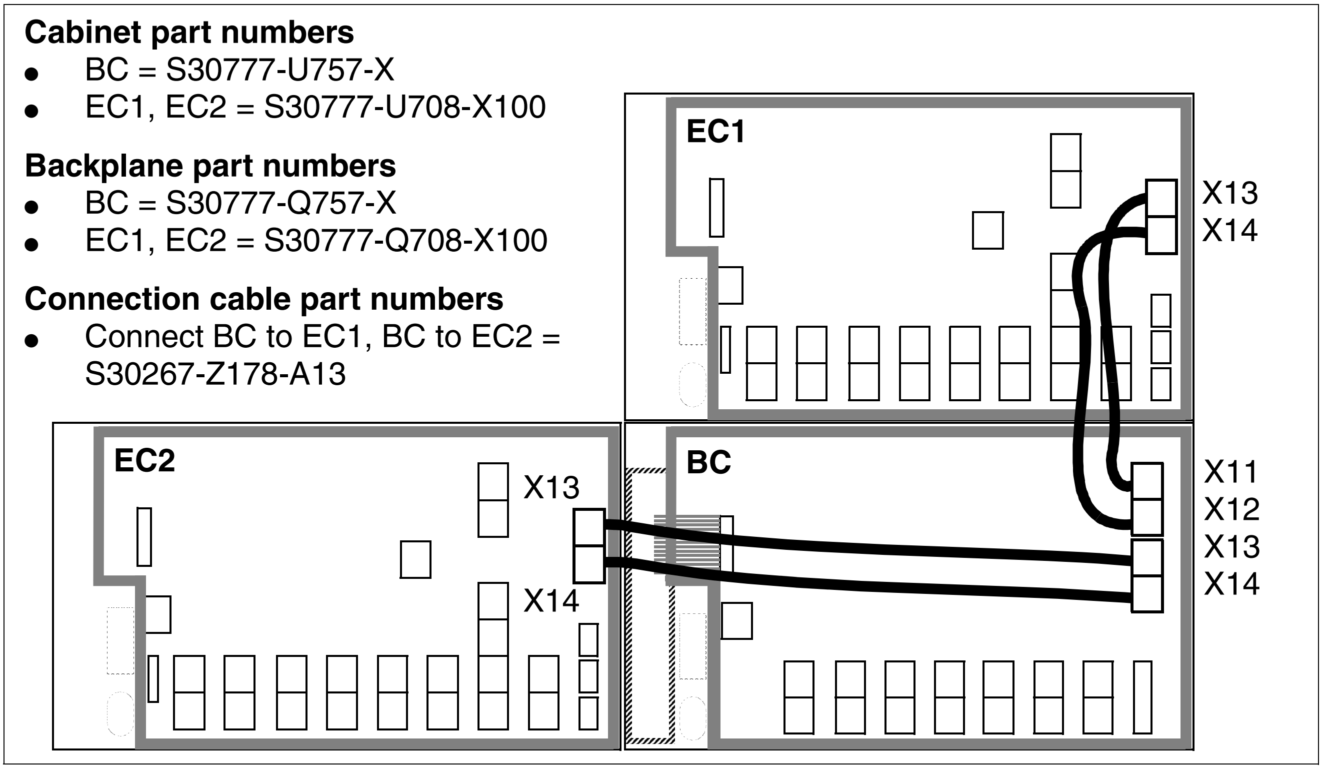


Figure 4-65 Two-Cabinet “8-Slot” System - Connection Cables between BC and EC1

Three-Cabinet “8-Slot” System: Connection Cable (See Table 4-12)



Cabinet part numbers

- BC = S30777-U757-X
- EC1, EC2 = S30777-U708-X100

Backplane part numbers

- BC = S30777-Q757-X
- EC1, EC2 = S30777-Q708-X100

Connection cable part numbers

- Connect BC to EC1, BC to EC2 = S30267-Z178-A13

Figure 4-66 Three-Cabinet “8-Slot” System - Connection Cables between BC, EC1 and EC2

The cables between the basic cabinet and the expansion cabinets are connected in a star configuration.

Terminating resistors in “8-slot” cabinets

- BC: Between slots CBCPR + 2 and 3 + 4 and 8 + UPSM
- EC1: Between slots 11 + 12 and 13 + 14 and 15 + 16 and 17 + UPSM
- EC2: Between slots 20 + 21 and 22 + 23 and 24 + 25 and 26 + UPSM

4.3.3.7.2 Connection between the MDFU or MDFU-E and Backplane

Introduction

Set up the connection between the main distribution frame and the system using CABLUs (prefabricated cabling units) with the following characteristics:

- System side: SIPAC 1 SU connector(s)
- Cable: 16 x 2 x 0.4
- Main distribution frame side:
  - Not for U.S.: Different distribution strips or carriers (Figure 4-69)
  - For U.S. only: 50-pin CHAMP jacks

Not for U.S.: Not more than 9 CABLUs per MDFU (Figure 4-70) and 21 CABLUs per MDFU-E (Figure 4-71) with one 16-TW strip or 25-TW strip (9 x 30 mm) strip can be implemented.

In special cases where the prefabricated CABLUs cannot be used, open-end cables should be used.

Not for U.S.: CABLUs for the slots containing peripheral boards (Figure 4-87)

If	Then
Assignment with SLMO8[1], SLMO24, SLA8N[1], SLA16N[1] or SLA24N	Route 16 TW to the MDFU or MDFU-E via SU Xx8 and 8 TW via SU Xx9, using a standard cable (with 16 TW) for each connection. Connect both cables (= 1 CABLU with SU connectors labeled 8 and 9) to the same jumper strip (25 TW). Part numbers for CABLUs with 25-TW jumper strip: ● S30269-Z100-A14: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-71) ● S30269-Z100-A24: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-71) Note: If replacing an old system, for example, you can use existing standard CABLUs with splitting strips for 16 TW. If an SLMO24 board is used, you must lay an additional CABLU (SU Xx9) to the MDFU or MDFU-E.
Assignment with TMS2	S_{2M} connections are not set up via the MDFU or MDFU-E. A direct connection is set up to the NT or networked system via the backplane connector SU Xx9 and a special cable (see Section 3.3.40, “TMS2 (Not for U.S.)”).

If	Then
Slot with any other peripheral board	Route 16 TW to the MDFU or MDFU-E via SU Xx8 using a CABLU. Part numbers for CABLUs with 16-TW jumper strips: ● S30269-Z100-A11: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-71) ● S30269-Z100-A21: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-71)
Assignment with REAL	16 TWs are routed to (and manually laid at) the MDFU or MDFU-E via SU X6 (backplane) using an open-end cable. Part numbers for open-end cable: ● S30267-Z192-A60: 6 m in length ● S30267-Z192-A100: 10 m in length ● S30267-Z192-A200: 20 m in length

[1] A CABLU with 16 TW is also sufficient for these boards. A CABLU with 24 TW is recommended to simplify station configuration expansion (for example, by replacing the SLMO8 by an SLMO24).

For U.S. Only: CABLUs for the slots containing peripheral boards (Figure 4-87)

If	Then
Slot with 24-port peripheral board	Route 16 TW to the main distribution frame via SU Xx8 and 8 TW via SU Xx9, using standard CABLU S30267-Z365-A30 (SU connectors are labeled "8" and "9"). Both cables are connected to the same 50-pin Champ jack.
Slot with 16-port peripheral board	Route 16 TW to the main distribution frame via SU Xx8 using standard CABLU S30267-Z365-A30.
Slot with TMST1	T1 connections (see Section 3.3.39, “TMST1 (for U.S. only)”) are not set up via the main distribution frame. An adapter (1 SU connector - 8-pin MW8 (RJ48C) jack, Figure 4-67) is connected directly to the SU Xx9 backplane connector. You can use a special cable to create a direct connection to the CSU or networked system.

S_{2M} adapter (SIPAC 1 SU - MW8 (RJ48C)

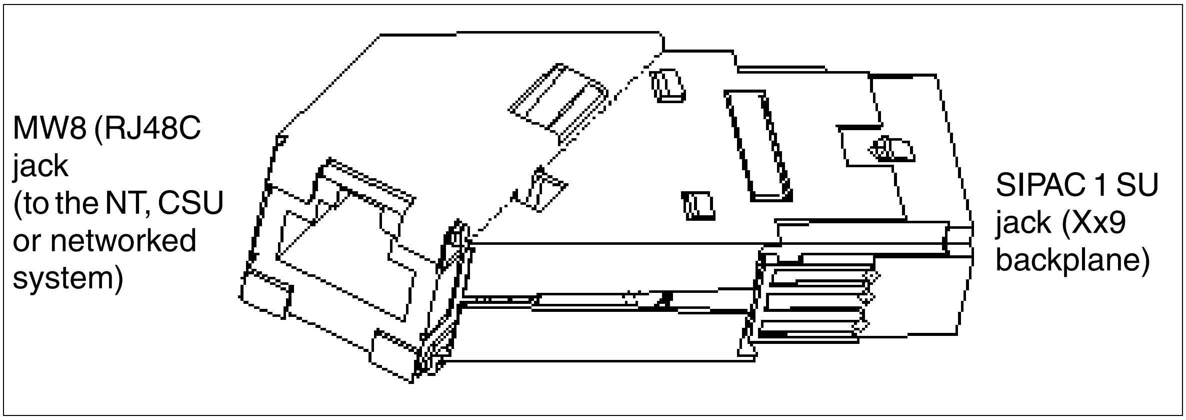
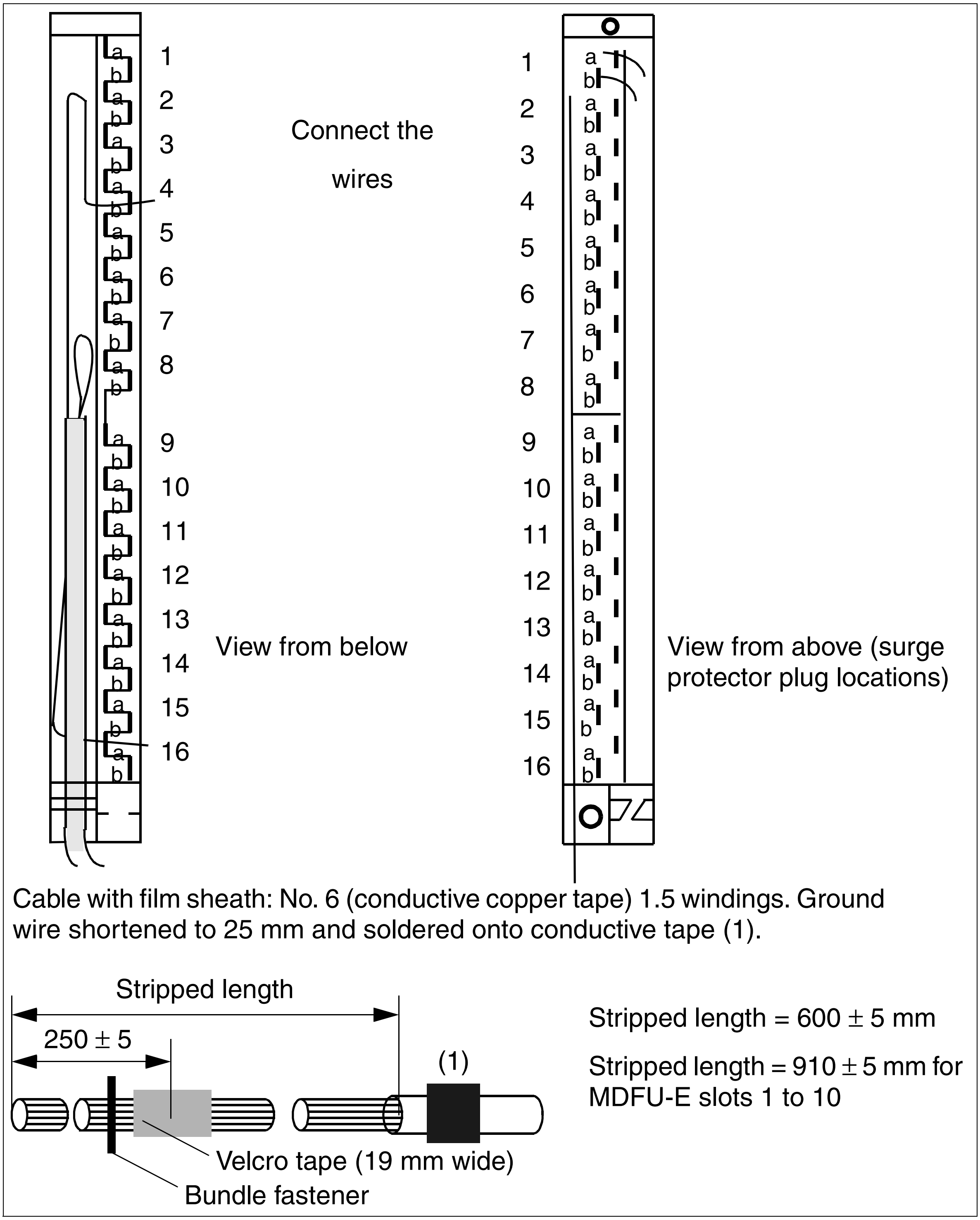

MW8 (RJ48C jack (to the NT, CSU or networked system)
SIPAC 1 SU jack (Xx9 backplane)

Figure 4-67 S_{2M} Adapter (SIPAC 1 SU - MW8 (RJ48C)) C39228-A7195-A12

Stripping the open-end cable


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
a
b
Connect the wires
View from below
View from above (surge protector plug locations)
Stripped length
250 ± 5
(1)
Velcro tape (19 mm wide)
Bundle fastener

Cable with film sheath: No. 6 (conductive copper tape) 1.5 windings. Ground wire shortened to 25 mm and soldered onto conductive tape (1).

Stripped length = 600 ± 5 mm

Stripped length = 910 ± 5 mm for MDFU-E slots 1 to 10

Figure 4-68 Stripping an Open-End Cable (not for the U.S.)

Color Codes for the Open-End Cable

Table 4-13 Color Codes for the Open-End Cable

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	Color group	Pair	a-Wire (Tip)	b-Wire (Ring)
1	1	wht/blu		3	11	blk/blu	
			blu/wht				blu/blk
	2	wht/ora			12	blk/ora	
			ora/wht				ora/blk
	3	wht/grn			13	blk/grn	
			grn/wht				grn/blk
	4	wht/brn			14	blk/brn	
			brn/wht				brn/blk
	5	wht/gry			15	blk/gry	
			gry/wht				gry/blk
2	6	red/blu		4	16	yel/blu	
			blu/red				blu/yel
	7	red/ora					
			ora/red				
	8	red/grn					
			grn/red				
	9	red/brn					
			brn/red				
	10	red/gry					
			gry/red				

4.3.3.8 Laying the Line Network and Setting Jumpers on the MDFU or MDFU-E

⚠ **Danger**
Connect the system to ground before connecting the stations.

Not for U.S.: Jumpers, external line network

Most main distribution frames do not have an external side. You must jumper them to the incoming line network (see jumpering duct, Figure 4-70 = MDFU, Figure 4-71 = MDFU-E). Use a standard wiring tool for laying the cable wires.

ℹ If you jumper stations on the MDFU or MDFU-E (for example, with an ICCS network) without first entering the relocate code, when you reconnect them the stations affected will go into operation with the data of the stations originally installed.

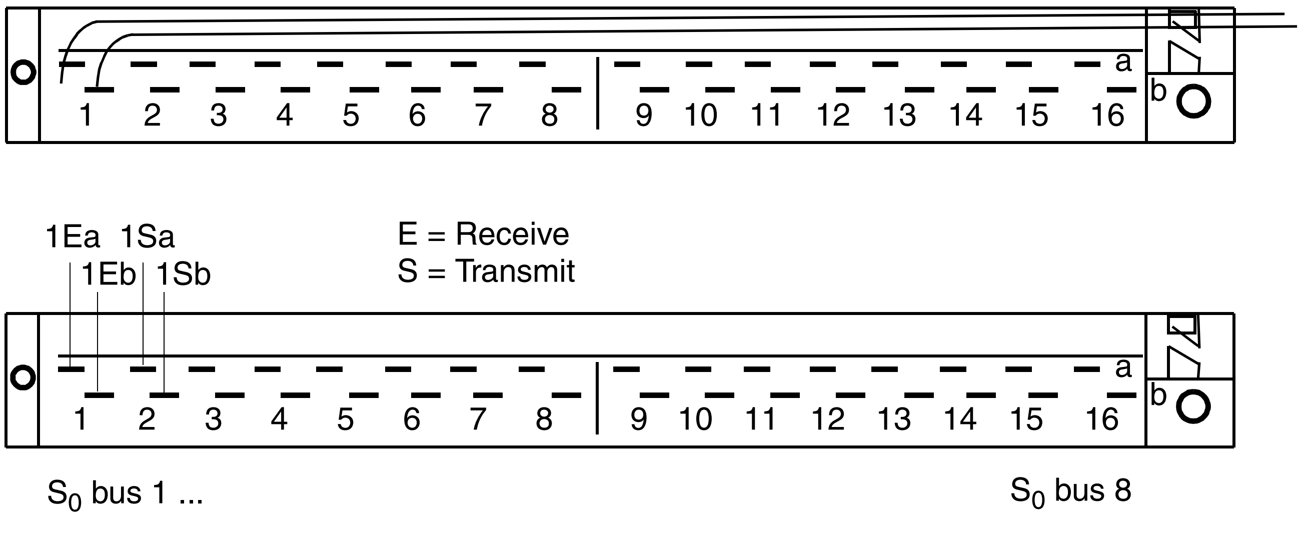
Not for U.S.: Surge protector

To divert surges caused by lightning, insert surge protectors on

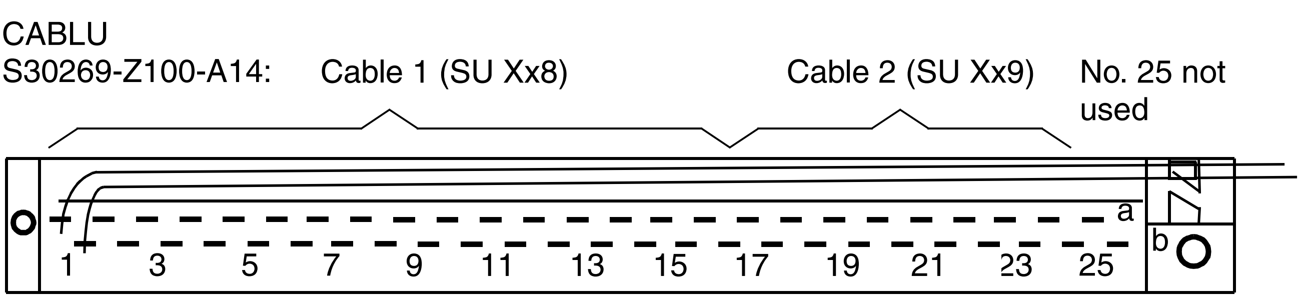
- lines that leave the system buildings (outside stations)
- lines > 500 m long.

Connect the polarized surge protectors to the plugging locations on the splitting strip described above (see Figure 4-68).

Splitting and jumper strips


a
b
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1Ea 1Sa
1Eb 1Sb
E = Receive
S = Transmit
a
b
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
S_0 bus 1 ...
S_0 bus 8

Splitting strip for 16 TW (C39334-A166-


CABLU
S30269-Z100-A14:
Cable 1 (SU Xx8)
Cable 2 (SU Xx9)
No. 25 not used
a
b
1 3 5 7 9 11 13 15 17 19 21 23 25

Jumper strip for 25 TW (C39334-A166-A3)

Figure 4-69 Assignment (Numbering) of the Splitting/Jumper Strips, (view from above) (not for U.S.)

Layout and dimensions of the MDFU

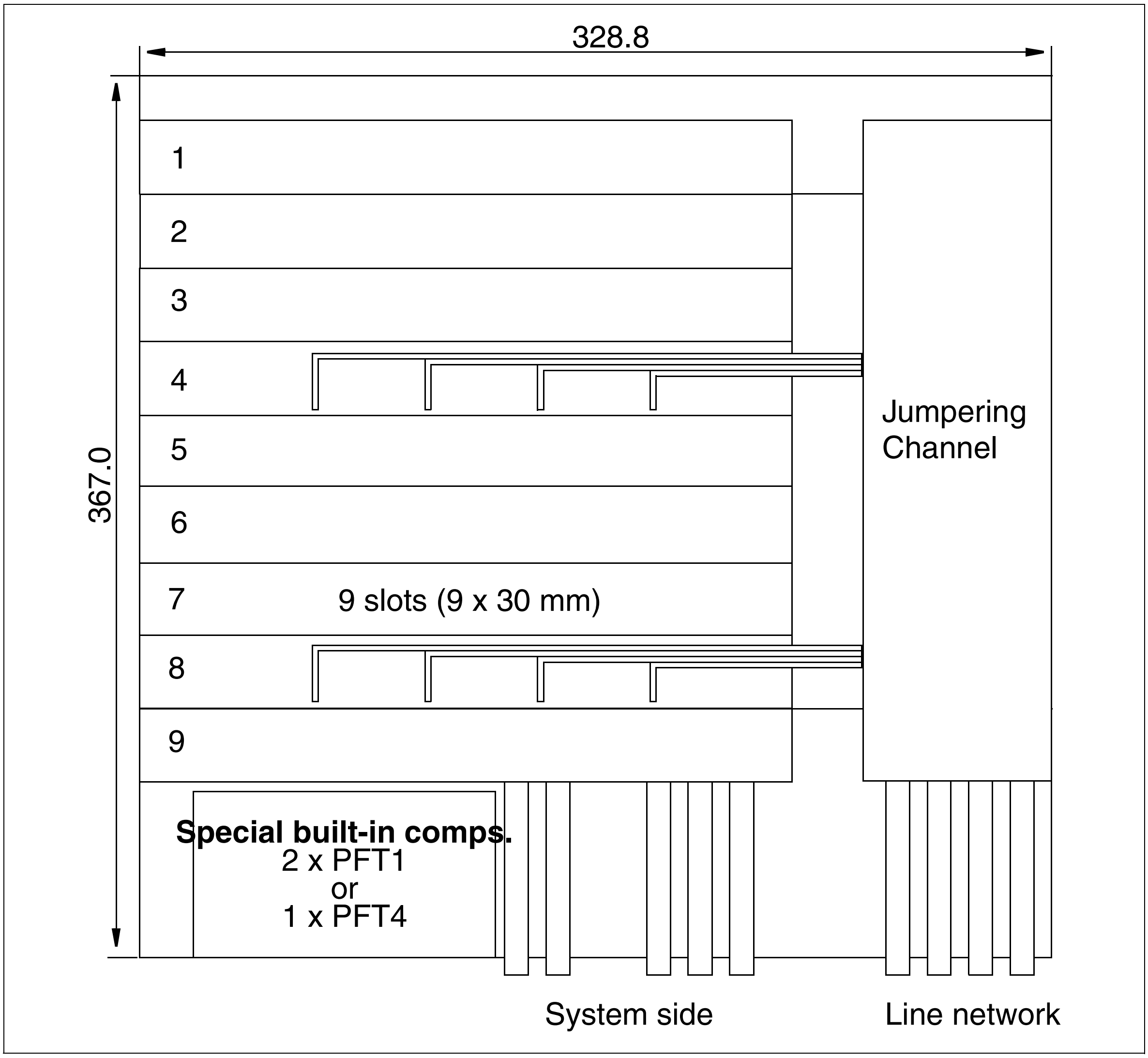

328.8
367.0
1
2
3
4
5
6
7
8
9
9 slots (9 x 30 mm)
Jumpering Channel
Special built-in comps.
2 x PFT1
or
1 x PFT4
System side
Line network

Figure 4-70 MDFU - Layout and Dimensions (367.0 x 328.8 x 125.4 mm) (not for U.S.)

Layout and dimensions of the MDFU-E

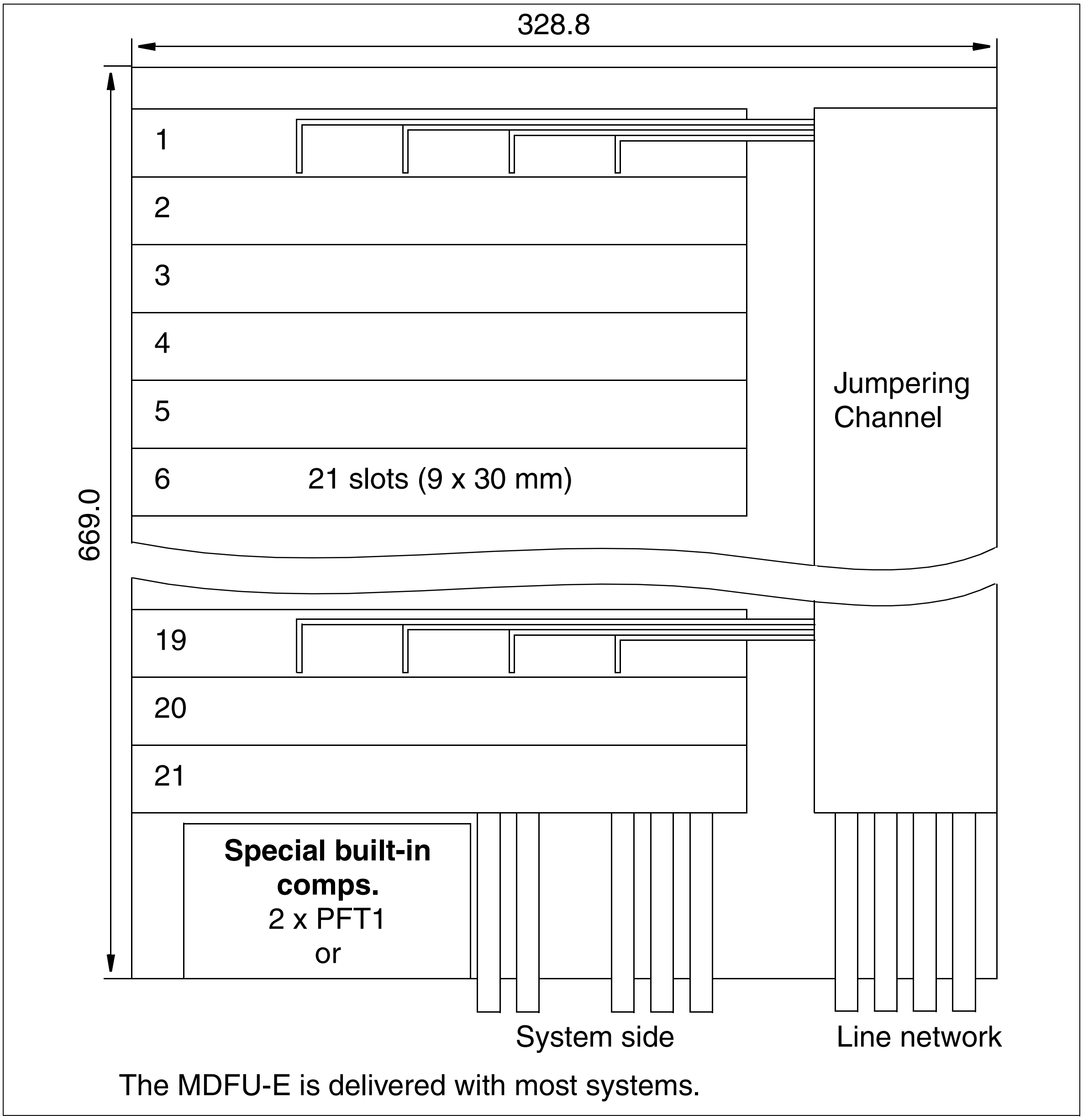

328.8
669.0
1
2
3
4
5
6
21 slots (9 x 30 mm)
19
20
21
Jumpering
Channel
Special built-in comps.
2 x PFT1
or
System side
Line network
The MDFU-E is delivered with most systems.

Figure 4-71 MDFU-E - Layout and Dimensions (669.0 x 328.8 x 125.4 mm) (not for U.S.)

4.3.3.8.1 For U.S. only: Connecting Network Facilities

DANGER
Ground the system properly before connecting the stations.

Connecting to the Point of Demarcation

Most main distribution frames are designed with a network demarcation block. You must cross-connect the MDF to the incoming trunks. Use a standard wiring tool for laying the cable wires.

Connecting to T1, PRI, or CorNet

Caution
The TMST1 module can only be installed in conjunction with a listed channel service unit (CSU).

Secondary Protection

DANGER
To protect against surge voltage caused by lightning, the following boards require secondary protection when their lines leave the building where the main distribution frame is housed:

- SLA16N / SLA24N
- TIEL4*
- TMDID8
- TMGL8
- TMST1**

* If not connected to facility provider terminal equipment.
** When this module is connected to the public network, secondary protection must be provided by the CSU.

4.3.4 Installing HiPath 3700 (19-Inch Cabinet)

Overview

This section contains information on how to install the HiPath 3700 communication system in a 19-inch cabinet. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment and expansions.

Information on

- the possible equipment of central boards with optional plug-in boards
- board configuration
- final visual inspection

applies to both HiPath 3700 and HiPath 3750 and is described starting in Section 4.3.5.

4.3.4.1 Selecting the Installation Site

The installation site is generally determined by the 19-inch cabinet already installed.

The environmental conditions specified in the system data chapter should also be taken into consideration in this case (Section 2.9).

Information on the design of the HiPath 3700 can be found in Section 2.2.2.5.

4.3.4.1.1 For U.S. only: AC outlet

An AC connection is required for each cabinet. The AC connection must fulfill the requirements specified in Table 4-14.

Table 4-14 Electrical Connection Values (for U.S. only)

Nominal voltage	**Nominal voltage range**		**Nominal Frequency Range**		**Wall Outlet Configurations**
	from	**to**	**from**	**to**	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

The system must be properly grounded before startup (see description in Section 4.3.4.5).

4.3.4.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.

⚠ **Caution**
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.3.4.3 Mounting the System Cabinet in the 19-Inch Cabinet

> ⚠ **WARNING**
> A fully equipped HiPath 3700 cabinet weighs 22 kg (48.46 lb). We recommend lifting cabinets only before they are equipped. Do not attempt to lift objects that you think are too heavy for you; use a hand truck or get assistance.

Introduction

You can install up to three system cabinets in a 19-inch cabinet. Each cabinet must be mounted separately.

It is only possible to extend the HiPath 3700 to a three cabinet system if the 19-inch cabinets are next to one another and accessible from the back.

Cabinets are supplied fitted with the specific boards required by the customer.

> ⚠ **Danger**
> Be sure to ground the system properly before starting it up and connecting the stations.

4.3.4.3.1 Removing the Cabinet Covers

How the covers are secured

The front cabinet cover (for board servicing) and the rear cabinet cover (for cable servicing) are each secured by two snap fasteners.

You can remove the upper and lower grills on both covers. This allows the cables to be routed to the patch panel for example.

To replace a cover, position the snap fasteners in the two guides and press down on the cover until it snaps into place.

Procedure (Figure 4-72)

Step	Activity
1.	Insert a slotted screwdriver (with the blade vertical) into a recess (1).
2.	Carefully swing the handle of the screwdriver toward the center of the cabinet (2) until the fastener snaps out and the cover loosens.
3.	Then insert the screwdriver in the second recess (3), loosen its snap fastener.

Mounting the cover

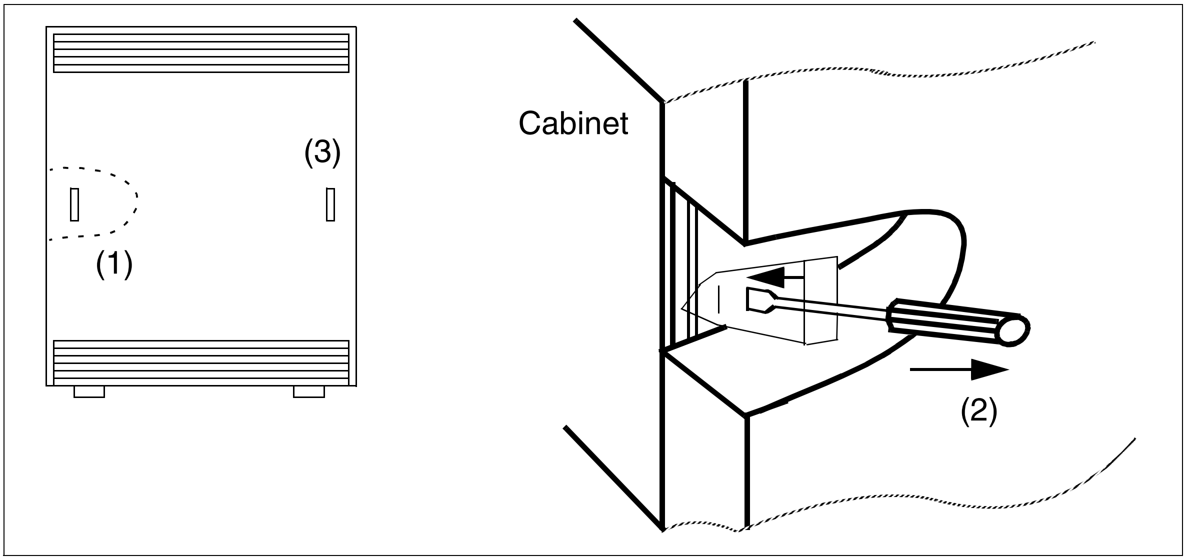


Figure 4-72 HiPath 3700 - Removing the Front and Rear Covers

> ⚠ **Warning**
> The front and rear covers on all system cabinets must be closed before the system is started up in a 19-inch cabinet.
> To replace a cover, position the snap fasteners in the two guides and press down on the cover until it snaps into place.

4.3.4.3.2 Mounting the System Cabinet with Angle Brackets

An assembly kit (C39165-A7027-D5) with eight angle brackets is provided for installing the 19-inch cabinet.

Procedure

⚠ **Warning**
Never attempt to lift a system cabinet into the 19-inch cabinet without assistance.

Step	Activity
1.	Attach a right-handed and a left-handed support bracket (A in Figure 4-73) to the 19-inch cabinet using two screws per bracket.
2.	Remove the front and rear cabinet covers.
3.	Remove both side pieces of the system cabinet.
4.	Attach the two angle brackets (B in Figure 4-73) to the front of the system cabinet using two screws per bracket.
5.	Attach the four angle brackets (C in Figure 4-73) to the rear of the system cabinet for base and cover support.
6.	Lift the system cabinet into the 19-inch cabinet and sit the cabinet on the two support brackets (A). Slide the cabinet into the 19-inch cabinet until the front edge of the system cabinet is flush with the front of the 19-inch frame.
7.	Attach the system cabinet to the angle bracket (B) in the 19-inch cabinet frame using two screws per bracket.

Installation in the 19-inch cabinet

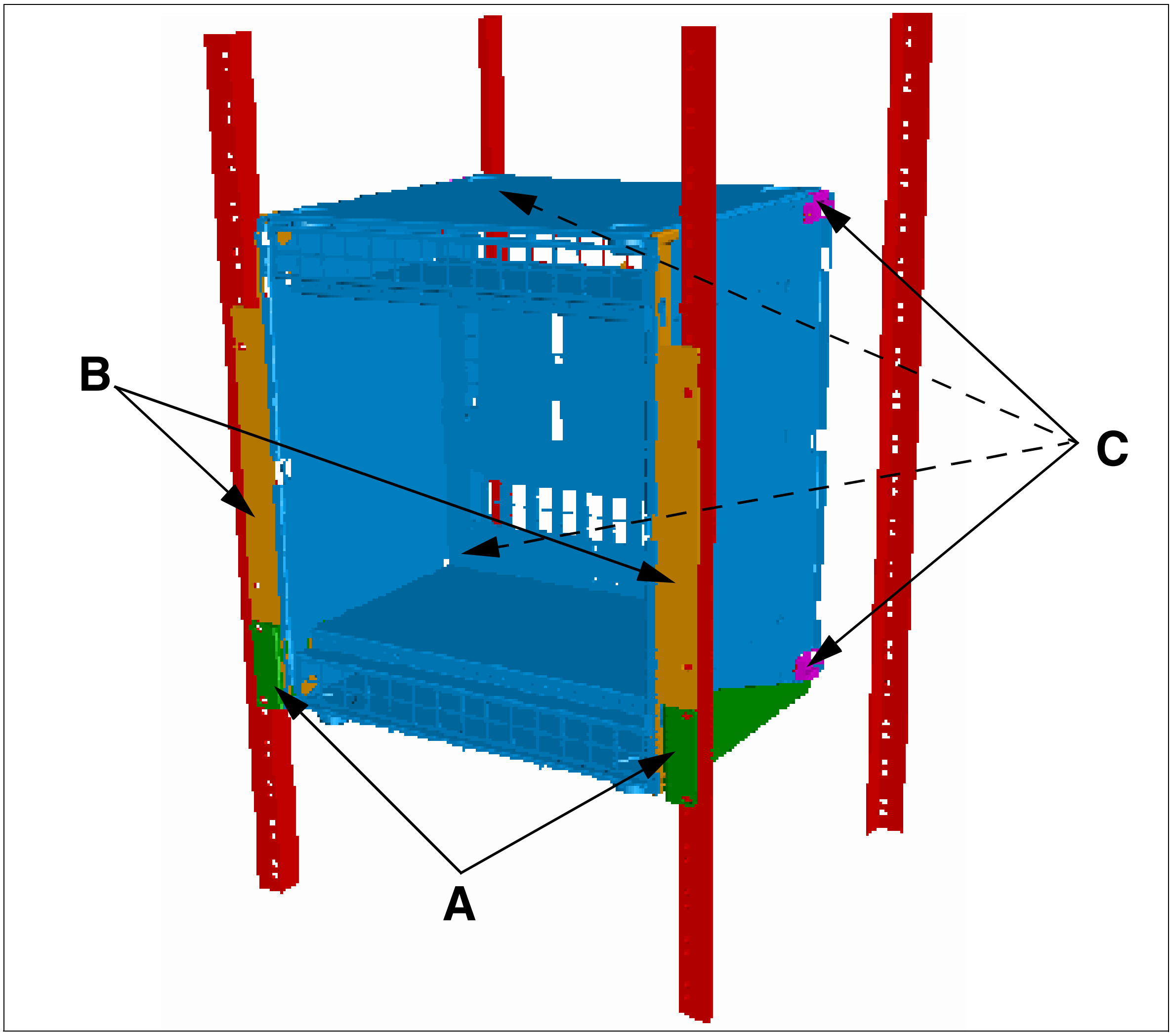


Figure 4-73 HiPath 3700 - Installation in the 19-Inch Cabinet

Laying the Connecting Cables

To lay the connection cables between system cabinets and patch panels, you can cut out the pre-stamped recesses in the bottom of system cabinet with a pair of diagonal cutting pliers and break them out with a pair of flat-nosed pliers.

> ⚠ **Caution**
> Be careful when breaking out the recesses. Remove any sharp edges and corners.

4.3.4.4 Mounting the Patch Panel in the 19-Inch Cabinet

The customer-specific communication network and HiPath 3700 are connected via patch panels. Patch panels are installed beneath the system cabinets in the 19-inch cabinet (upward thermal radiation).

Installation Procedure

Install the patch panel immediately under the system cabinet (A in Figure 4-74) and attach it to the left and right of the 19-inch frame using two screws (B) on each side.

Mounting the patch panel

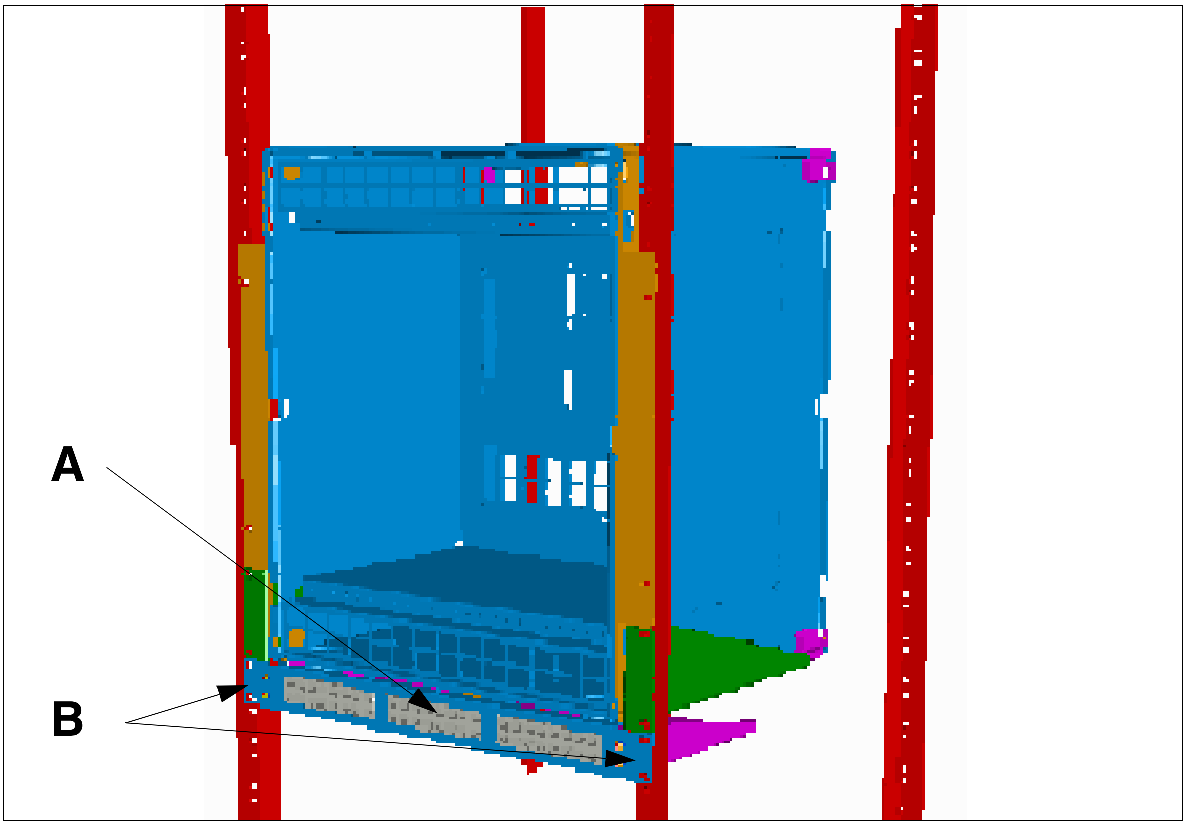


Figure 4-74 HiPath 3700 - Mounting the Patch Panel

4.3.4.5 Grounding the System

Grounding: Inspection and Implementation

Preliminary Inspection of the 19-Inch Cabinet:		
Is the 19-inch cabinet grounded by a separate **ground conductor** (green/yellow)?	**NO** ▶	The 19-inch cabinet must be grounded by a separate ground conductor (green/yellow). **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground.
YES ▼		
Does the 19-inch cabinet have a **potential equalization bus** at which the HiPath 3700 can be grounded as shown in Figure 4-75?	**NO** ▶	A potential equalization bus must be installed in the 19-inch cabinet and connected to the ground conductor. **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground.
YES ▼		
If you answer “Yes” to both questions, the system (system cabinets, patch panels) may be grounded as described below.		

⚠ **Danger**

Each HiPath 3700 system cabinet and each patch panel (S30807-K6143-X) must be grounded as shown in Figure 4-75 by a separate ground conductor (minimum cross-section = 2.5 mm^2). Make sure that the ground conductor is securely installed and strain-relieved.

Please note:

The 19-inch cabinet’s potential equalization bus may only be used if it is grounded by a separate ground conductor.

Failure to follow these instructions can result in electrical shock.

Grounding the system cabinets and patch panels

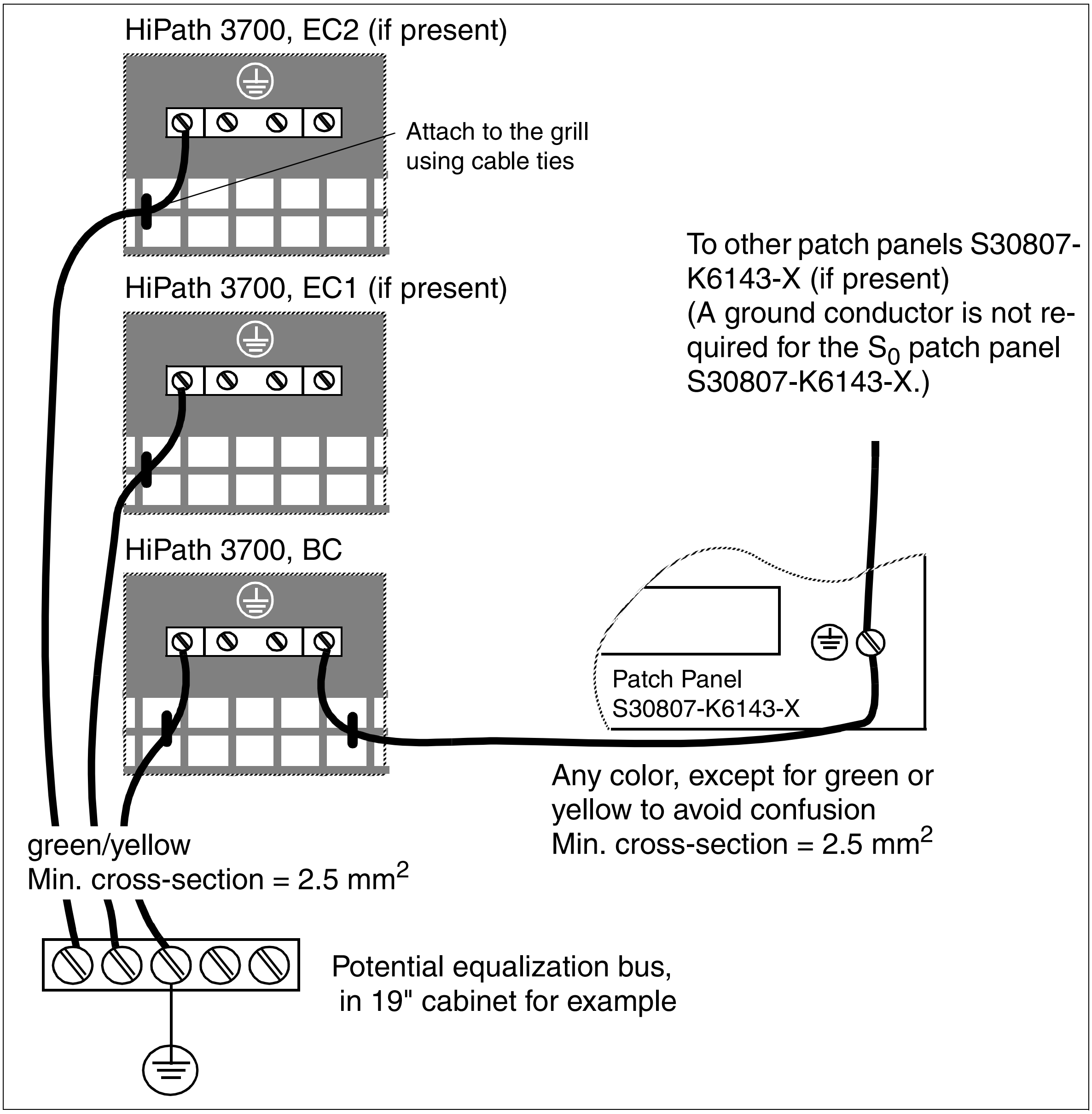

HiPath 3700, EC2 (if present)
Attach to the grill using cable ties
HiPath 3700, EC1 (if present)
To other patch panels S30807-K6143-X (if present)
(A ground conductor is not required for the S_0 patch panel S30807-K6143-X.)
HiPath 3700, BC
Patch Panel S30807-K6143-X
Any color, except for green or yellow to avoid confusion
Min. cross-section = 2.5 mm^2
green/yellow
Min. cross-section = 2.5 mm^2
Potential equalization bus, in 19" cabinet for example

Figure 4-75 HiPath 3700- Grounding the Systems and Patch Panels in a 19-Inch Cabinet

Note on possible ground loops

> To avoid ground loops from remotely operated devices (V.24 system peripherals), the devices should be connected to the same low-voltage network (sub-distribution board) if possible.
> If the building floor plan does not permit this, you may need a line driver to isolate the external devices in the event of a malfunction.

4.3.4.6 Checking the Grounding

Procedure

Perform the tests in the table below to ensure that the system is properly grounded before startup.

Step	Activity	Target
1.	Check the ohmic resistance of the ground connection to the 19-inch cabinet: Perform measurement between the PE (protective earth) on a socket in the internal installation (at the system's installation site) and HiPath 3700. Prerequisites: ● No device in the 19-inch cabinet is connected to the low-voltage network via the power cable. ● The system's separate grounding (basic cabinet, expansion cabinet, patch panel) and the grounding of the 19-inch cabinet are connected.	< 10 ohms
2.	Check the ohmic resistance between the individual system parts (basic cabinet, expansion cabinets, patch panels). Prerequisite: HiPath 3700 is not yet connected to the low-voltage network via the power cable.	< 1 ohm

4.3.4.7 Connecting the Cable to the Backplane

All cables that leave the cabinet must be attached to the ventilation grill on the metal back panel using cable ties.

4.3.4.7.1 Backplanes on the “8-Slot” Cabinets

The “8-slot” basic cabinet has seven slots, while the expansion cabinets each have eight slots for peripheral boards.

Backplane on the “8-slot” basic cabinet

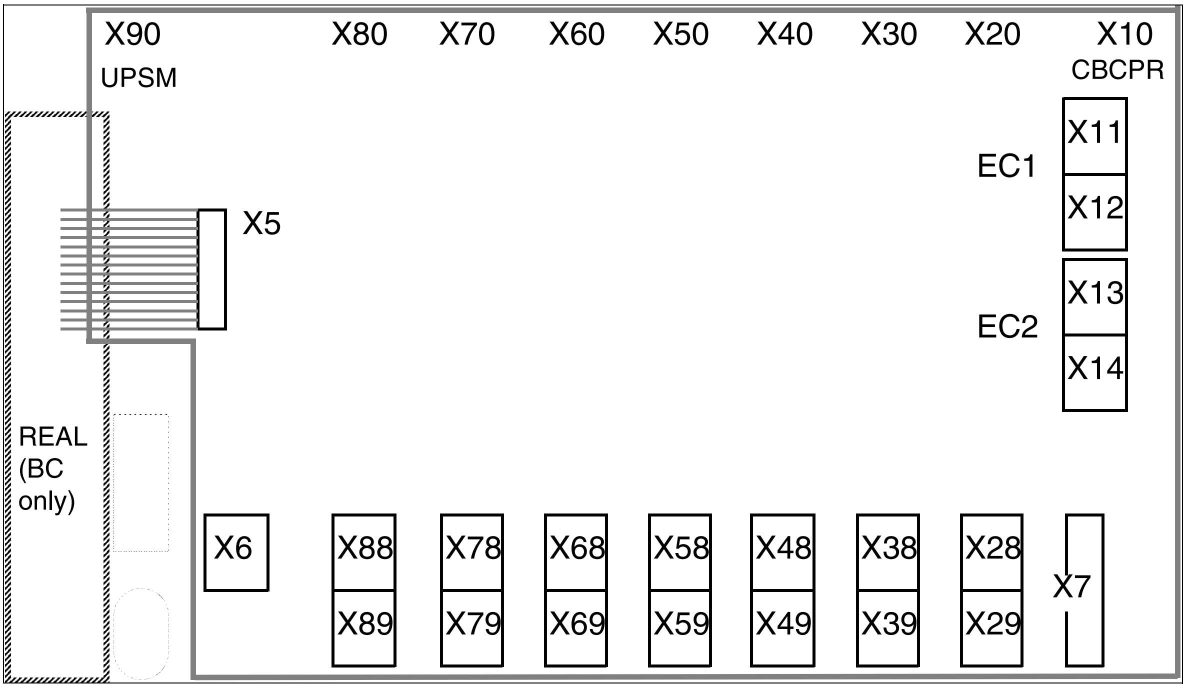

X90
UPSM
X80
X70
X60
X50
X40
X30
X20
X10
CBCPR
EC1
X11
X12
X5
EC2
X13
X14
REAL (BC only)
X6
X88
X89
X78
X79
X68
X69
X58
X59
X48
X49
X38
X39
X28
X29
X7

Figure 4-76 HiPath 3700 - Backplane on the “8-Slot” Basic Cabinet

Backplane on the “8-slot” expansion cabinets

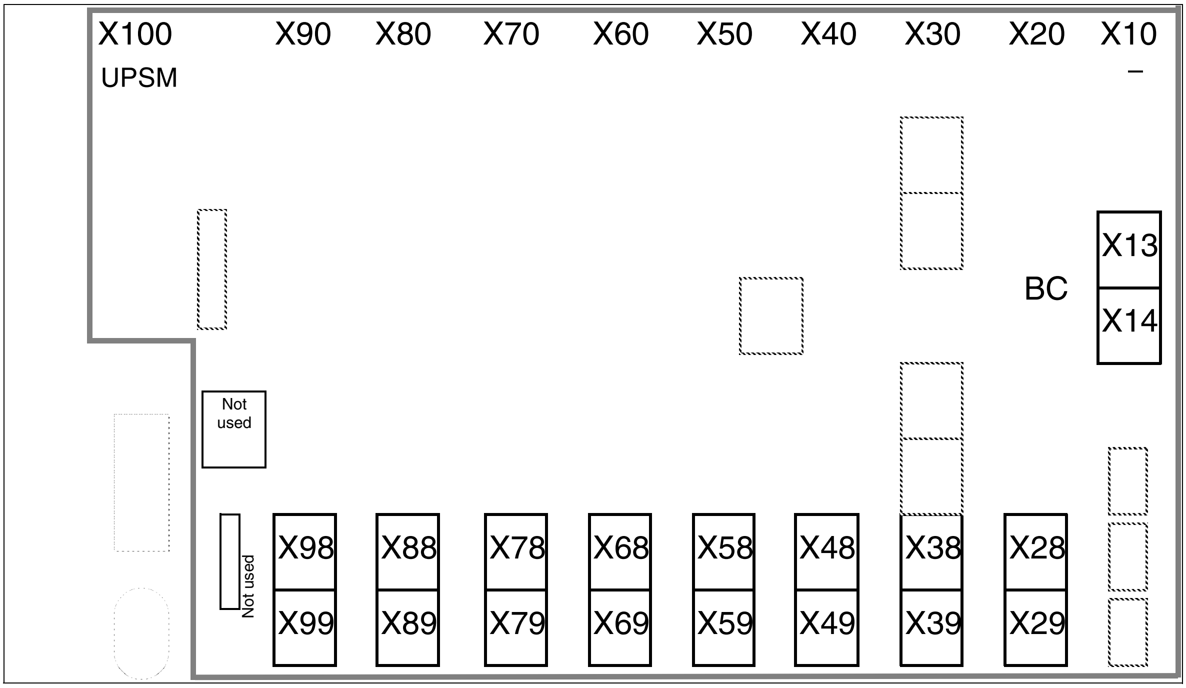

X100
UPSM
X90
X80
X70
X60
X50
X40
X30
X20
X10
–
X13
BC
X14
Not used
Not used
X98
X99
X88
X89
X78
X79
X68
X69
X58
X59
X48
X49
X38
X39
X28
X29

Figure 4-77 HiPath 3700 - Backplane on the “8-Slot” Expansion Cabinets

Jack Assignment on the “8-Slot” Backplane

Table 4-15 Jack Assignment on the “8-Slot” Backplane

Connector	Cabinet	Function
X7	BC	V.24 interface (no electrical isolation) via 25-pin jack: Connection for printer, Plus products, and other devices.
X5	BC	Cable connector to REAL
X6	BC	S_0-patch-panel-to-REAL connection via SU connector
X11	BC	Cable connector to EC1: X13
X12	BC	Cable connector to EC1: X14
X13	BC EC1 EC2	Cable connector to EC2: X13 Cable connector to BC: X11 Cable connector to BC: X13
X14	BC EC1 EC2	Cable connector to EC2: X14 Cable connector to BC: X12 Cable connector to BC: X14
X28 - X88	All	1 SU connector each (16 TW) to the patch panel

Table 4-15 Jack Assignment on the “8-Slot” Backplane

Connector	Cabinet	Function
X98	EC1 EC2	1 SU connector each (16 TW) to the patch panel
X29 - X89	All	1 SU connector each (8 TW) to the patch panel (not for S_{2M})
X99	EC1 EC2	1 SU connector each (8 TW) to the patch panel (not for S_{2M})

Connection cables between the “8-slot” basic and expansion cabinets

If installing a multi-cabinet system, you must also connect the cables between the BC and ECs.

If	Then
Two-cabinet System	Connect BC to EC1 = 2 cables (S30267-Z178-A13) (see Figure 4-78)
Three-cabinet System	• Connect BC to EC1 = 2 cables (S30267-Z178-A13) • Connect BC to EC2 = 2 cables (S30267-Z178-A13) (see Figure 4-79)

Two-Cabinet “8-Slot” System: Connection Cable (See Table 4-15)

Cabinet part numbers

- BC = S30777-U757-X
- EC1 = S30777-U708-X100

Backplane part numbers

- BC = S30777-Q757-X
- EC1 = S30777-Q708-X100

Connection cable part numbers

- For connecting BC to EC1 = S30267-Z178-A13

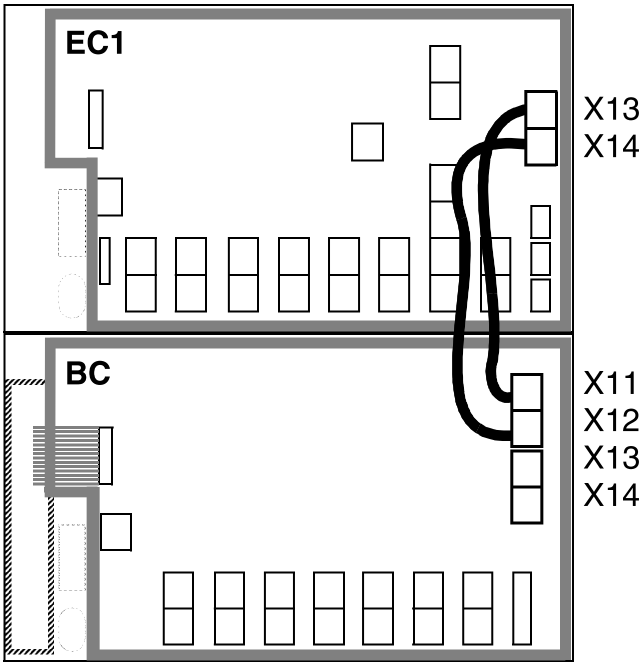
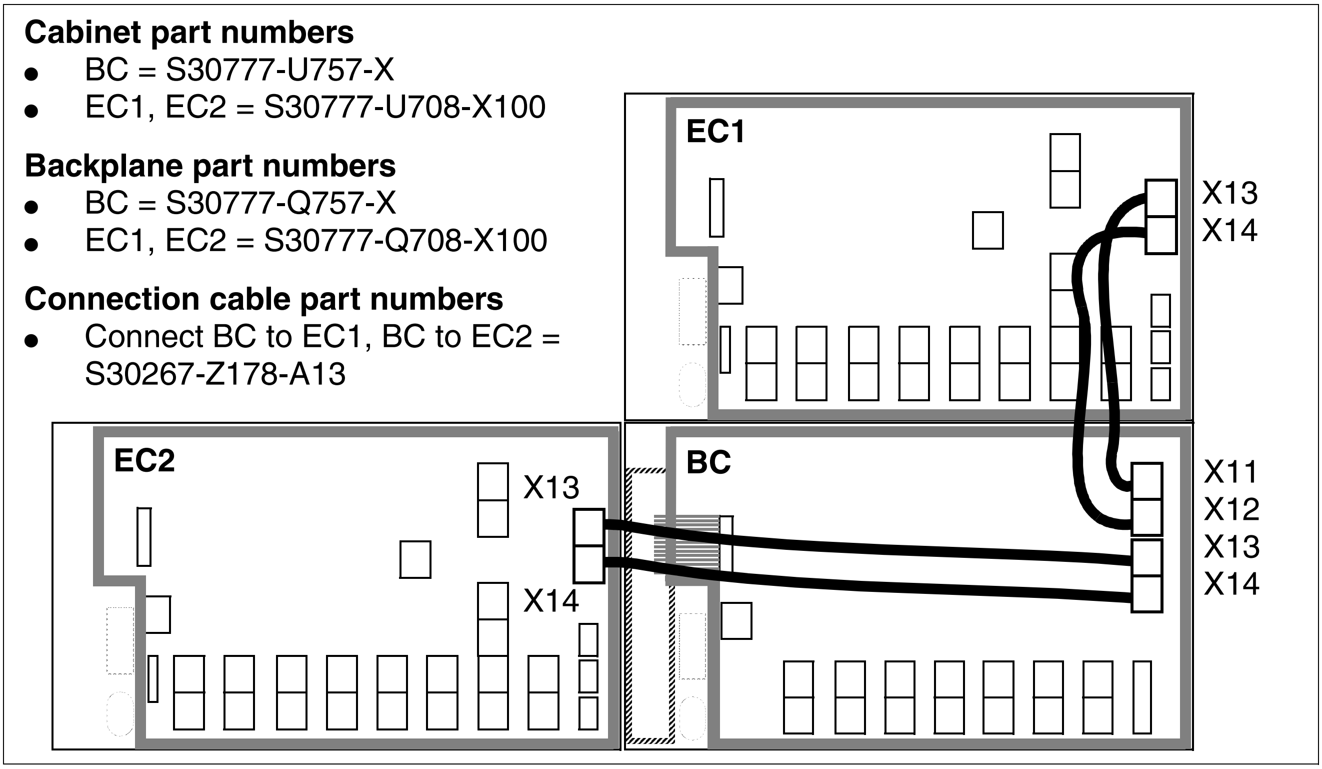


Figure 4-78 Two-Cabinet “8-Slot” System - Connection Cables between BC and EC1

Three-Cabinet “8-Slot” System: Connection Cable (See Table 4-15)



Cabinet part numbers

- BC = S30777-U757-X
- EC1, EC2 = S30777-U708-X100

Backplane part numbers

- BC = S30777-Q757-X
- EC1, EC2 = S30777-Q708-X100

Connection cable part numbers

- Connect BC to EC1, BC to EC2 = S30267-Z178-A13

Figure 4-79 Three-Cabinet “8-Slot” System - Connection Cables between BC, EC1 and EC2

The cables between the basic cabinet and the expansion cabinets are connected in a star configuration.

Terminating resistors in “8-slot” cabinets

- BC: Between slots CBCPR + 2 and 3 + 4 and 8 + UPSM
- EC1: Between slots 11 + 12 and 13 + 14 and 15 + 16 and 17 + UPSM
- EC2: Between slots 20 + 21 and 22 + 23 and 24 + 25 and 26 + UPSM

4.3.4.7.2 Connecting the Patch Panel and Backplane (in the 19-Inch Cabinet)

Introduction

Set up the connection between the patch panel and system using CABLUs (prefabricated cabling units) with the following characteristics:

- System side: SIPAC 1 SU jack
- Cable: 16 x 2 x 0.4 (the standard cable length is 2 m)
- Patch panel side:
  - Not for U.S.: Open-end cable (for STMD8) or SIVAPAC socket connectors (for all other boards)
  - For U.S. only: ---

Not for U.S.: CABLUs for the slots containing peripheral boards

If	Then
Assignment with SLMO8[1], SLMO24, SLA8N[1], SLA16N[1] or SLA24N	Route 16 TW to the patch panel (S30807-K6143-X) via SU Xx8 and 8 TW via SU Xx9 using a standard cable (with 16 TW) for each connection. Connect both cables (= 1 CABLU with SU jacks labeled 8 and 9) to the same SIVAPAC socket terminal strip (25 TW). Part number for CABLU with 24 TW: ● S30267-Z363-A20: 2 m in length
Assignment with STMD8	You need a special S_0 patch panel (C39104-Z7001-B3) for this. The 16 TW are routed to (and manually laid at) the S_0 patch panel via SU Xx8 (backplane) using an open-end cable. Part numbers for open-end cable: ● S30267-Z192-A60: 6 m in length ● S30267-Z192-A100: 10 m in length ● S30267-Z192-A200: 20 m in length
Assignment with TMS2	S_{2M} connections are not set up via a patch panel. An adapter (SIPAC 1 SU jack - 8-pin MW8 (RJ48C) jack, Figure 4-85) is connected directly to the SU Xx9 backplane connector. You can use a special cable (see Section 3.3.40, “TMS2 (Not for U.S.)”) to create a direct connection to the NT or networked system.

If	Then
Slot with any other peripheral board	Route 16 TW to the patch panel (S30807-K6143-X) via SU Xx8 using a CABLU. Part number for CABLU with 16 TW: ● S30267-Z362-A20: 2 m in length
Assignment with REAL	Route the REAL board via an S_0 patch panel (C39104-Z7001-B3). The 16 TW are routed to (and manually laid at) the S_0 patch panel via SU X6 (backplane) using an open-end cable. Part numbers for open-end cable: ● S30267-Z192-A60: 6 m in length ● S30267-Z192-A100: 10 m in length ● S30267-Z192-A200: 20 m in length

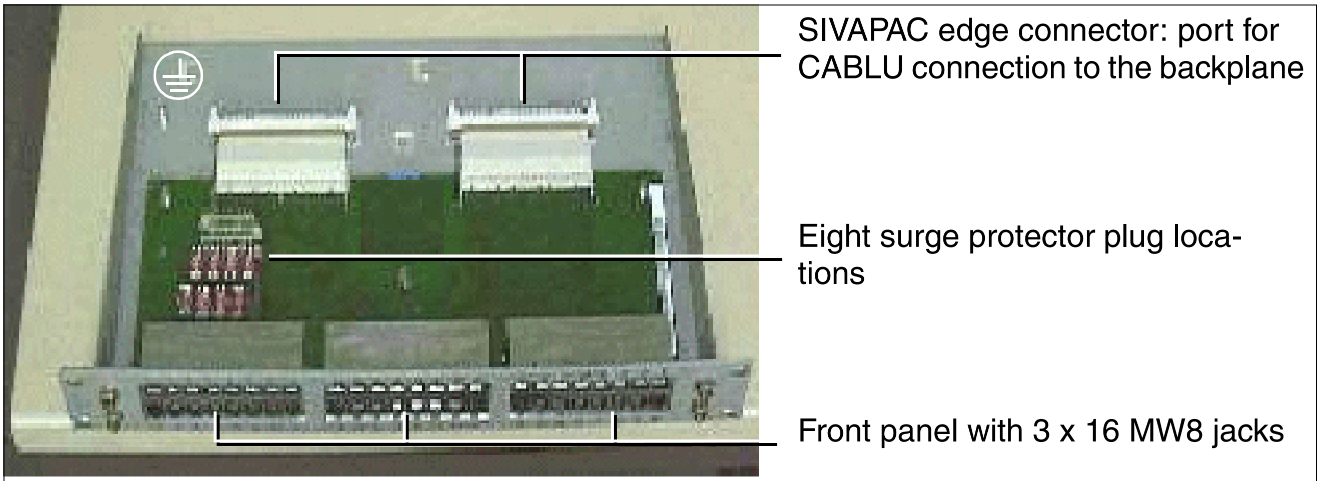
[1] A CABLU with 16 TW is also sufficient for these boards. A CABLU with 24 TW is recommended to simplify station configuration expansion (for example, by replacing the SLMO8 by an SLMO24).

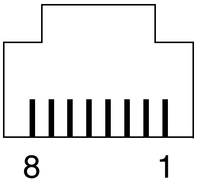
For U.S. only: CABLUs for the slots containing peripheral boards

If	Then
Slot with 24-port peripheral boards	Route 16 TW to the patch panel via SU Xx8 and 8 TW via SU Xx9, using standard CABLU S30267-Z365-A30 (SU connectors are labeled "8" and "9"). Both cables are connected to the same 50-pin Champ jack.
Slot with 16-port peripheral boards	Route 16 TW to the main distribution frame via SU Xx8 using standard CABLU S30267-Z365-A30.
Slot with TMST1	T1 connections (see Section 3.3.39, “TMST1 (for U.S. only)”) are not set up via the main distribution frame. An adapter (1 SU connector - 8-pin MW8 (RJ48C) jack, Figure 4-85) is connected directly to the SU Xx9 backplane connector. You can use a special cable to create a direct connection to the CSU or networked system.

Structure of the Patch Panel S30807-K6143-X

> All incoming cables must be attached to the patch panel using cable ties.


SIVAPAC edge connector: port for CABLU connection to the backplane
Eight surge protector plug locations
Front panel with 3 x 16 MW8 jacks



MW8 jack assignment:
4 = a-wire
5 = b-wire

Necessary height units for 19-inch cabinet assembly: 1
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 4-80 Patch Panel S30807-K6143-X

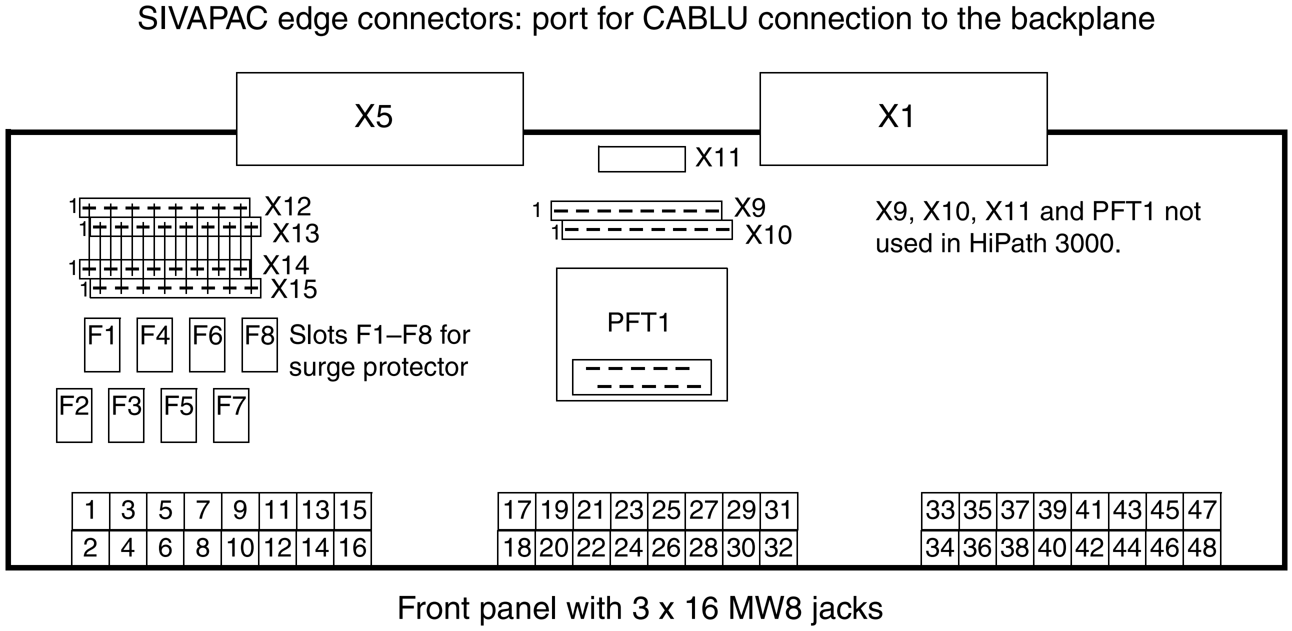
Information on MW8 jack assignment on the front of the patch panel is provided in the board descriptions (in the “Cable and Connector Assignment” table) in Chapter 3.

Surge protector

To divert surges caused by lightning, insert surge protectors on

- lines that leave the system buildings (outside stations)
- lines > 500 m long.

Connect the polarized surge protectors to slots F1 – F8 provided on the patch panel (seeFigure 4-81).


SIVAPAC edge connectors: port for CABLU connection to the backplane
X5
X1
X11
1 X12
1 X13
1 X14
1 X15
1 X9
1 X10
X9, X10, X11 and PFT1 not used in HiPath 3000.
PFT1
F1 F4 F6 F8
Slots F1–F8 for surge protector
F2 F3 F5 F7
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
17 19 21 23 25 27 29 31
18 20 22 24 26 28 30 32
33 35 37 39 41 43 45 47
34 36 38 40 42 44 46 48
Front panel with 3 x 16 MW8 jacks

Options for connecting the external line network:

- Connection via the MW8 jacks on the front of the patch panels. Using jumper wire, bridges must be inserted between the terminal strips X12 and X14 and between X13 and X15. The contact between the connector X5 and the first eight MW8 jacks is only set up when wire bridges are present.
- Direct connector jumpering on the X12/X13 connector. Bridges are not necessary in this case.

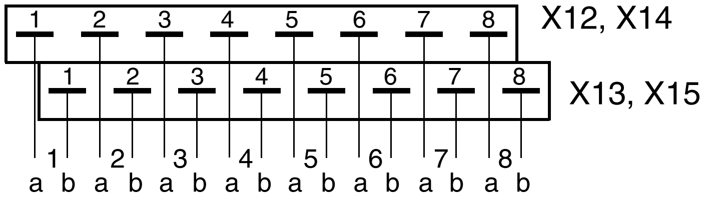
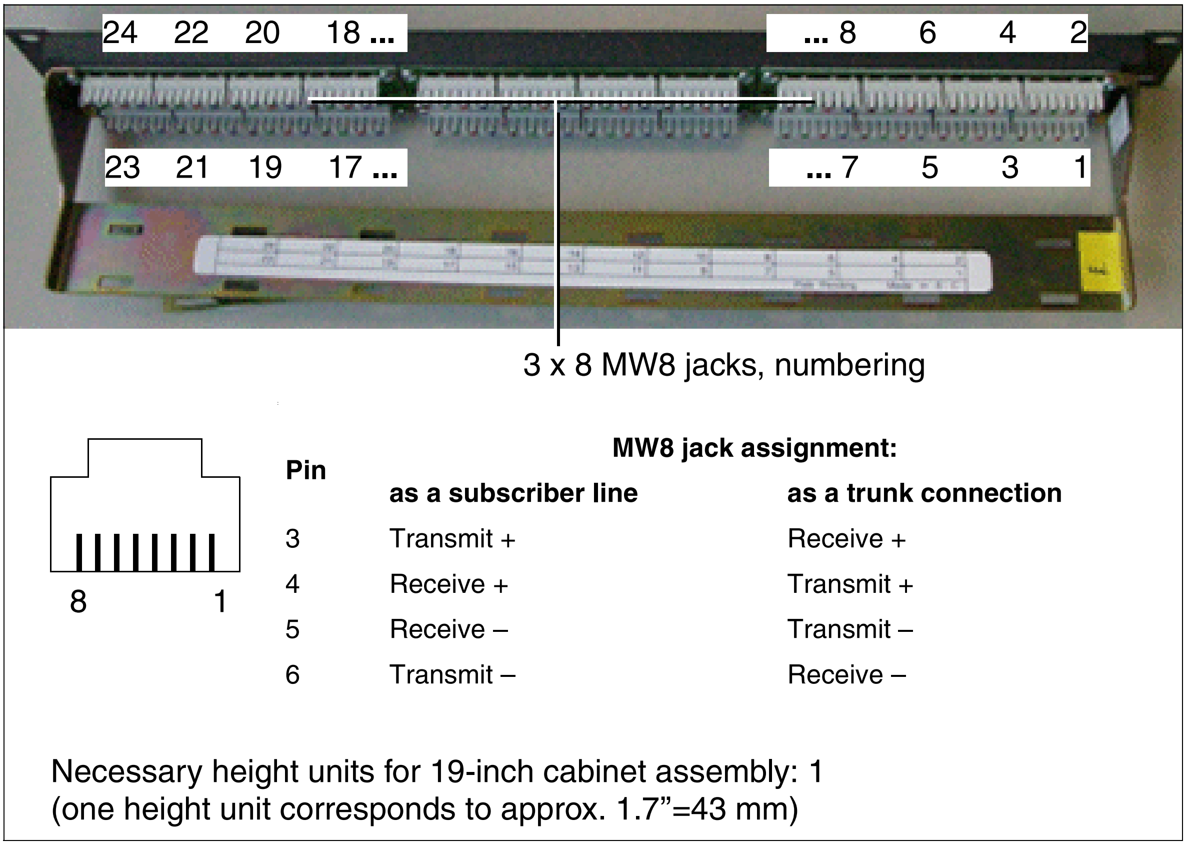

1 2 3 4 5 6 7 8
X12, X14
1 2 3 4 5 6 7 8
X13, X15
1 2 3 4 5 6 7 8
a b a b a b a b a b a b a b a b

Figure 4-81 Structure of the Patch Panel S30807-K6143-X

Structure of the S_0 patch panel C39104-Z7001-B3

All incoming cables must be attached to the patch panel using cable ties.



MW8 jack assignment:

Pin	**as a subscriber line**	**as a trunk connection**
3	Transmit +	Receive +
4	Receive +	Transmit +
5	Receive –	Transmit –
6	Transmit –	Receive –

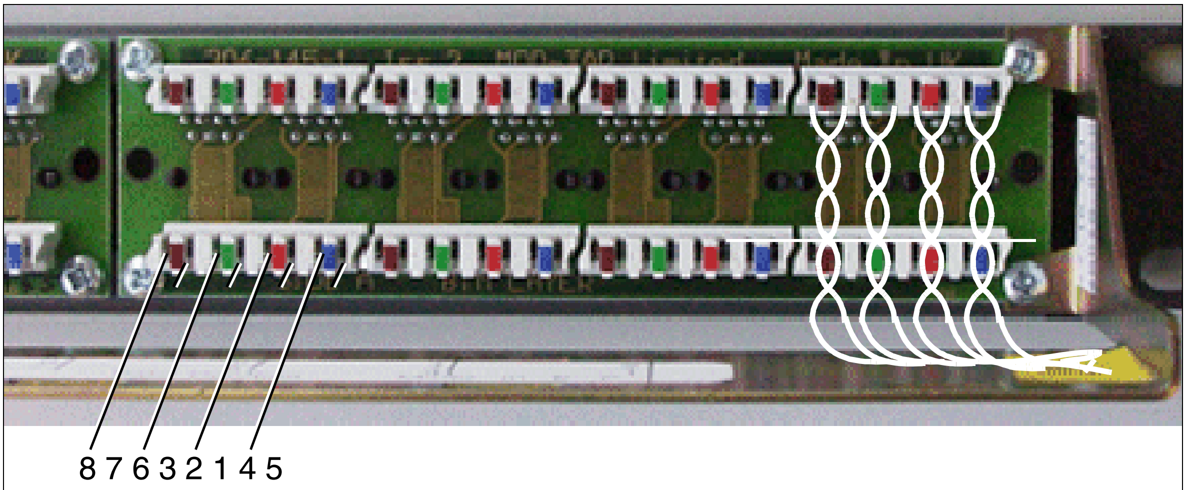
Necessary height units for 19-inch cabinet assembly: 1
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 4-82 S_0 Patch Panel C39104-Z7001-B3

CABLUs must be manually connected to the S_0 patch panel (Figure 4-83). You can use the Krone wiring tool for this.

Refer to the following tables for information on the assignment of the MW8 jacks:

- Table 3-97 for STMD8 board
- Table 3-163 for REAL board

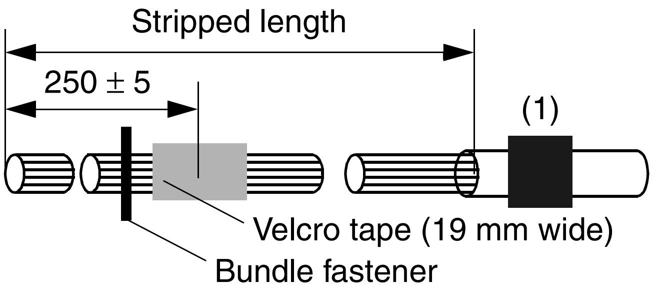


Pin assignment of MW8 jacks

Twist the wire pairs before laying them.

Figure 4-83 Laying Wire Pairs at the S_0 Patch Panel

Stripping the open-end cable for the S_0 patch panel



Cable with film sheath: No. 6 (conductive copper tape) 1.5 windings. Ground wire shortened to 25 mm and soldered onto conductive tape (1).

Stripped length = 600 mm ± 5 mm

Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	Color group	Pair	a-Wire (Tip)	b-Wire (Ring)	Color group	Pair	a-Wire (Tip)	b-Wire (Ring)
1	1	wht/blu		2	6	red/blu		3	11	blk/blu	
			blu/wht				blu/red				blu/blk
	2	wht/ora			7	red/ora			12	blk/ora	
			ora/wht				ora/red				ora/blk
	3	wht/grn			8	red/grn			13	blk/grn	
			grn/wht				grn/red				grn/blk
	4	wht/brn			9	red/brn			14	blk/brn	
			brn/wht				brn/red				brn/blk
	5	wht/gry			10	red/gry			15	blk/gry	
			gry/wht				gry/red				gry/blk
								4	16	yel/blu	
											blu/yel

Figure 4-84 Stripping the Open-End Cable for the S_0 Patch Panel

S_{2M} adapter (SIPAC 1 SU - MW8 (RJ48C)

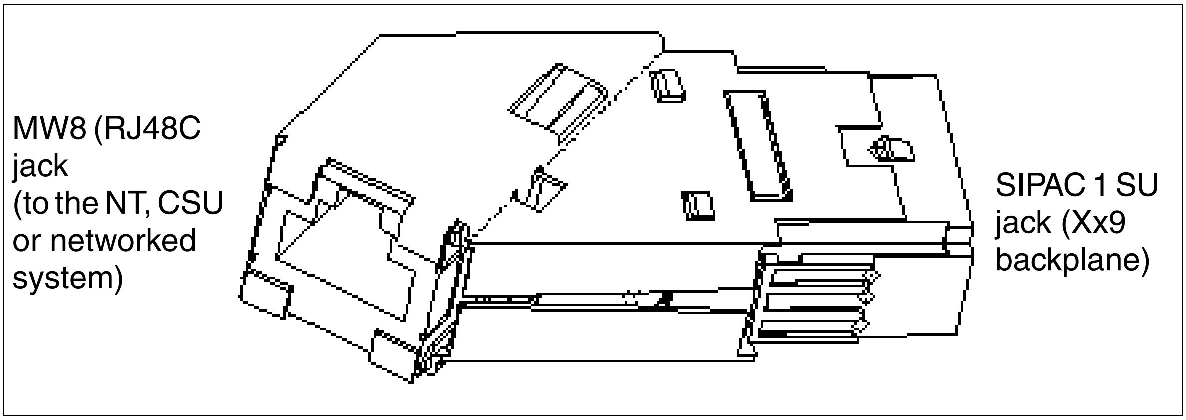

MW8 (RJ48C jack (to the NT, CSU or networked system)
SIPAC 1 SU jack (Xx9 backplane)

Figure 4-85 S_{2M} Adapter (SIPAC 1 SU - MW8 (RJ48C)) C39228-A7195-A12

4.3.4.8 Connecting the Line Network to the Patch Panel

Danger
Connect the system to ground before connecting the stations.

Telephones and trunks are connected directly to the MW8 jacks on the front of the patch panel. Information on MW8 jack assignment on the front of the patch panel is provided in the board descriptions (in the “Cable and Connector Assignment” table) in Chapter 3.

If you jumper stations on the patch panel (for example, with an ICCS network) without first entering the relocate code, when you reconnect them the stations affected will go into operation with the data of the stations originally installed.

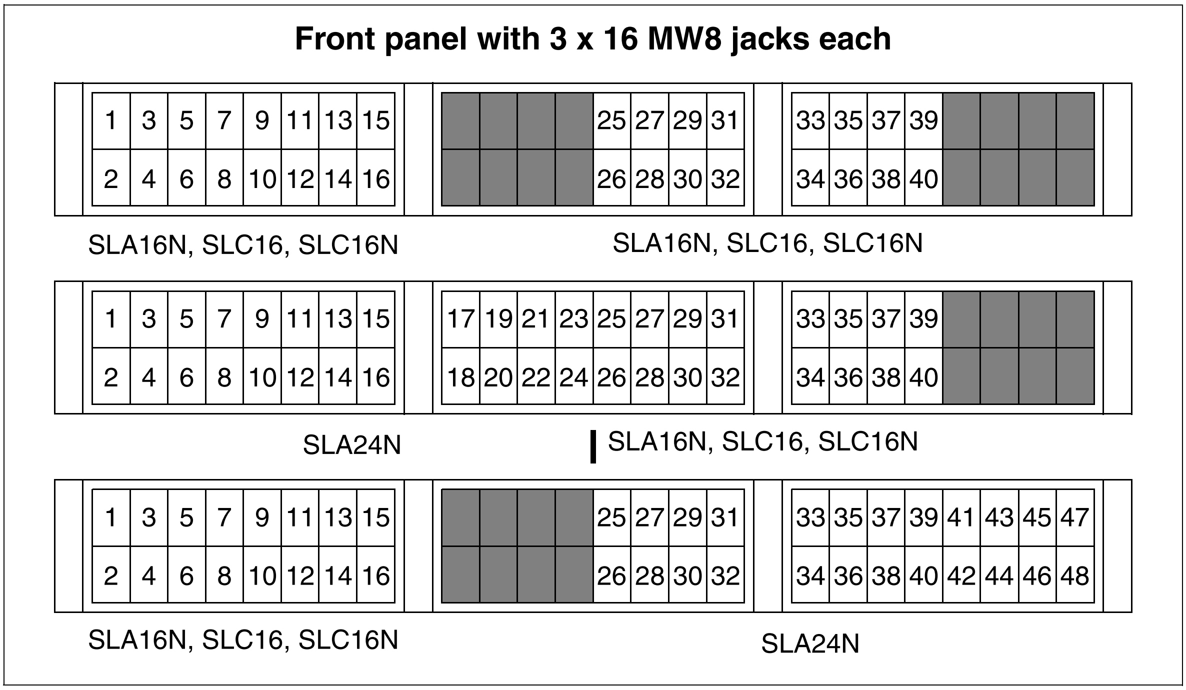

Front panel with 3 x 16 MW8 jacks each
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
25 27 29 31
26 28 30 32
33 35 37 39
34 36 38 40
SLA16N, SLC16, SLC16N
SLA16N, SLC16, SLC16N
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
17 19 21 23 25 27 29 31
18 20 22 24 26 28 30 32
33 35 37 39
34 36 38 40
SLA24N
SLA16N, SLC16, SLC16N
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16
25 27 29 31
26 28 30 32
33 35 37 39 41 43 45 47
34 36 38 40 42 44 46 48
SLA16N, SLC16, SLC16N
SLA24N

Figure 4-86 Layout of the Patch Panel S30807-K6143-X for Different Peripheral Boards

4.3.5 Loading the System Software and Installing Subboards on the CBCPR

⚠ **Caution**
Always wear an antistatic wristband when working on the system (especially when handling boards). Connect the wristband to the slide-in shelf in the cabinet using the alligator clip.

The cabinets are already equipped with the boards needed for the customer-specific requirements when the system is delivered.

The central control boards are not always fully equipped when delivered. Optional plug-in boards are packaged individually.

See Chapter 3 for information on slots for subboards on the central control boards.

⚠ **Caution**
Place the central control board on a flat surface before installing subboards.
The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-6).
Otherwise you may damage the board.

4.3.6 Configuration notes

Introduction

The cabinet/cabinets is/are already equipped with the boards needed for the customer-specific requirements when the system is delivered.

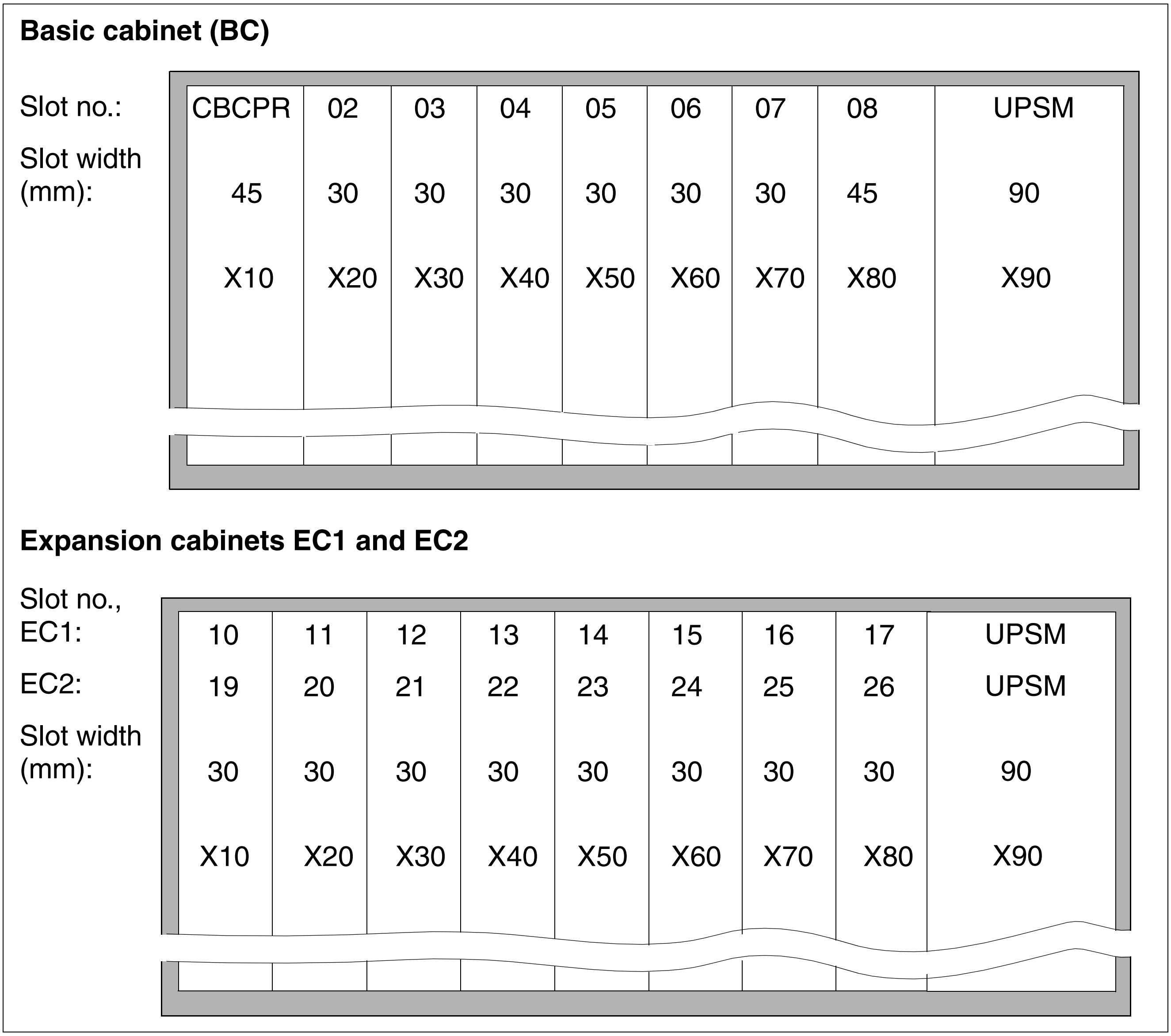
Board slots in “8-slot” cabinets

Nine board slots are available in each cabinet. The following boards are assigned permanent slots:

- CBCPR central processor board -> slot 01 in the BC
- UPSM power supply unit -> slot 09 in the BC, slot 18 in EC1, slot 27 in EC2.

Depending on their width, peripheral boards can be inserted in slots 02 to 08 in the BC, 10 to 17 in EC1 and 19 to 26 in EC2 (the adhesive label beneath each slot identifies the slot) (see Figure 4-87).

Slots in “8-slot” basic and expansion cabinets



Basic cabinet (BC)

Slot no.:	CBCPR	02	03	04	05	06	07	08	UPSM
Slot width (mm):	45	30	30	30	30	30	30	45	90
	X10	X20	X30	X40	X50	X60	X70	X80	X90

Expansion cabinets EC1 and EC2

Slot no., EC1:	10	11	12	13	14	15	16	17	UPSM
EC2:	19	20	21	22	23	24	25	26	UPSM
Slot width (mm):	30	30	30	30	30	30	30	30	90
	X10	X20	X30	X40	X50	X60	X70	X80	X90

Figure 4-87 Slot Numbers and Widths in “8-Slot” BC, EC1, and EC2

Width of the peripheral boards

Peripheral boards are divided into

- Wide boards requiring a slot 45 mm (1.75”) wide:
  - TML8W with GEE8
    Use a 45 mm slot even if you are not installing a GEE8 so that you can easily add a GEE8 later.
  - TMDID8 (for U.S. only)
- Narrow boards requiring a slot 30 mm (1.2”) wide (= all other boards)

You can insert wide boards into a 30 mm (1.2") slot. but if you do so, you can no longer use the slot to its right.

> ⚠ **Caution**
> Always wear an antistatic wristband when working on the system (especially when handling boards).

Initializing the Boards

The system software detects the boards in ascending order, starting with the lowest installation position the first time the system starts up. The system initializes subscriber line circuits and ports in the sequence indicated by the arrow (Figure 4-88).

The system activates all connected boards in the following situations:

- The maximum configuration has not yet been reached. While sequentially scanning the slots for each board, the system software checks whether the maximum number of stations or trunks has been exceeded. If it has, the board is not activated. The board LED shows the board’s status.
- At least one B channel on line trunk modules is available for the slot (only the available number of B channels is activated).

Assignment of subscriber line circuits and ports

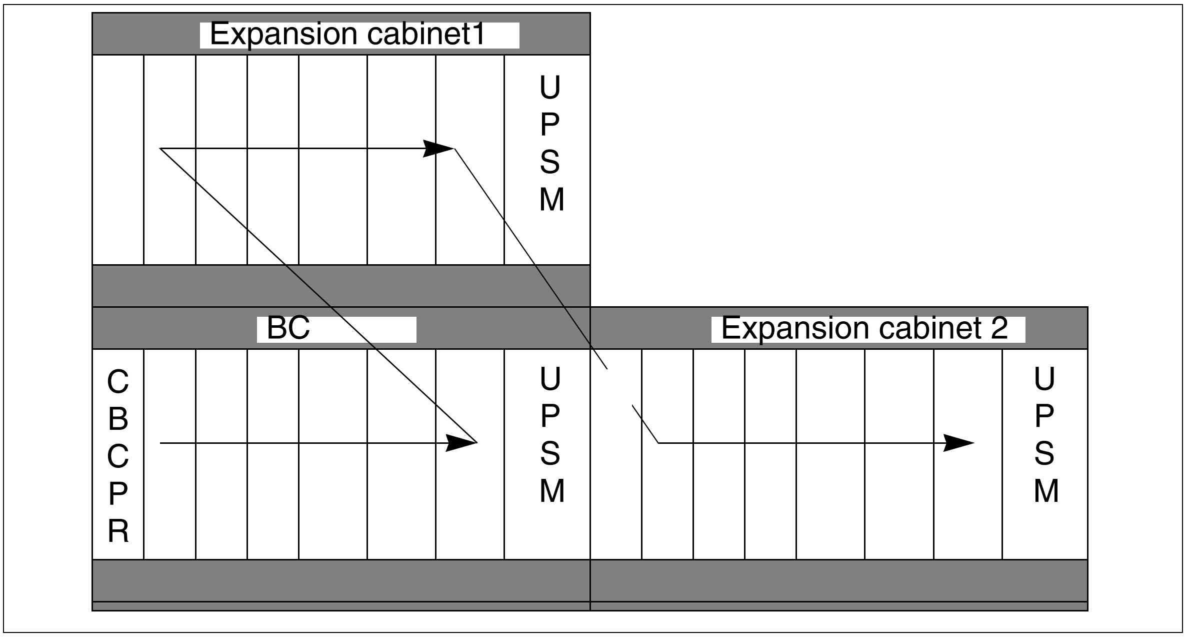

Expansion cabinet1
UPSM
BC
CBCPR
UPSM
Expansion cabinet 2
UPSM

Figure 4-88 HiPath 3750 and HiPath 3700 - Initialization of Subscriber Line Circuits and Ports

For U.S. only: Recommended configuration

To avoid B-channel blocking, install the TMST1 board only in the BC or in the first two slots of the ECs. HiPath 3000 Manager E observes this rule when performing off-line configuration.

Distribution of the PCM segments

There are 64 time-division multiplex channels available for each PCM segment. Blockages occur if these are busy. The system cannot execute any more call requests.

To guarantee that the system operates without blocking, make sure when you perform configuration that the boards on a PCM segment do not require more than the 64 time-division multiplex channels that are available. The following table lists the number of time-division multiplex channels that the different boards require.

Table 4-16 Number of Time-Division Multiplex Channels Required Per Board

Board	Number of time-division multiplex channels required
CR8N	8
HXGM3 (without extension modules for additional DSP channels)	16
IVML8	8
IVML24	24
SLA8N, SLA16N, and SLA24N	Depends on the number of stations
SLC16/SLC16N	Depends on the number of mobile telephones logged on
SLMO8, SLMO24	Depends on the number of stations (hosts (master) **and** clients (slave))
STMD8	16
TIEL	4
TMDID8	8
TML8W	8
TMS2	30
TMST1	24

Caution
The following board assignment rules must be observed to ensure that the system works properly and without blocking:

- **SLC16, SLC16N**
  - Maximum SLC16 or SLC16N per PCM segment. The SLC16 or SLC16N should be configured alone on the PCM segment, where possible.
  - Note the following information on the subject of multi-SLCs: “SLC16 and SLC16N board distribution in HiPath 3750 and HiPath 3700 cabinets” on page 3-143.
- **IVML8, IVML24** (see Section 3.3.5)
  - A maximum of one IVML8 or IVML24 per system.
  - Then install them in the slot beside the power supply in the basic cabinet or the expansion cabinets.
  - No SLC16 or SLC16N may be inserted in the PCM segment of the IVML8/ IVML24.
  - No SLMO24 may be inserted in the PCM segment of the IVML24.
  - If a TMS2 is configured on the PCM segment of the IVML24, only a board with a maximum of 8 ports may be inserted in the free slot.
- **SLMO24**
  A maximum of two SLMO24s per PCM segment; the number of connected stations (hosts (master) **and** clients (slaves)) may not be more than 64.

The figures below show the PCM segments (64 time-division multiplex channels each) for the different HiPath 3750 and HiPath 3700 system configurations.

Single-cabinet system: PCM segments

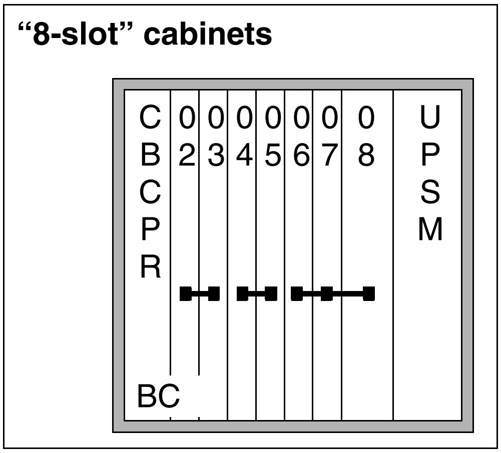


Figure 4-89 PCM Segments for a One-Cabinet System

Two-cabinet system: PCM segments

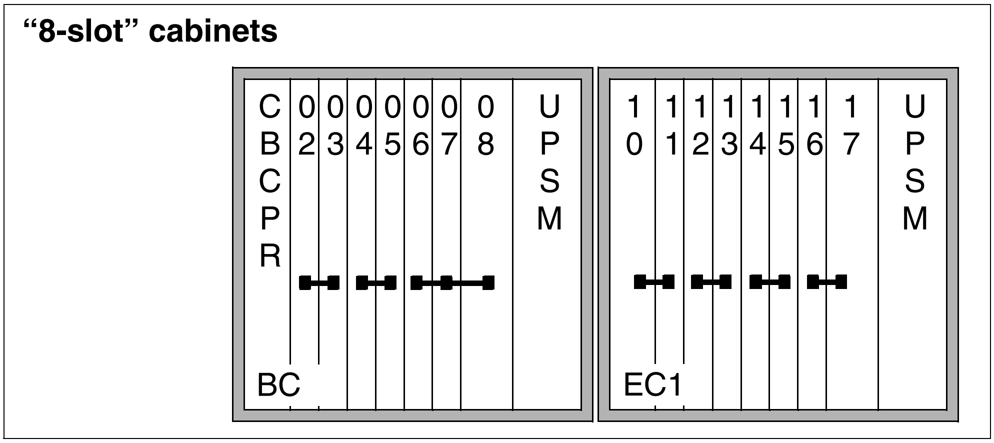

"8-slot" cabinets
CBCPR
02
03
04
05
06
07
08
UPSM
BC
10
11
12
13
14
15
16
17
UPSM
EC1

Figure 4-90 PCM Segments for a Two-Cabinet System

Three-cabinet system: PCM segments

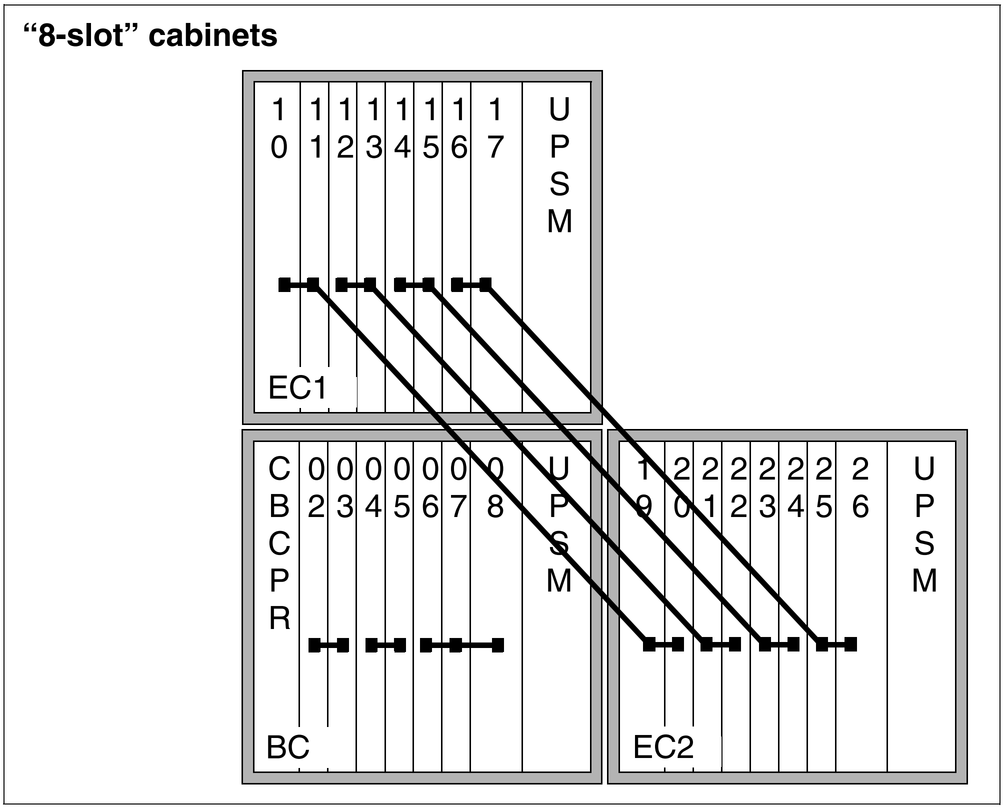

"8-slot" cabinets
10
11
12
13
14
15
16
17
UPSM
EC1
CBCPR
02
03
04
05
06
07
08
UPSM
BC
19
20
21
22
23
24
25
26
UPSM
EC2

Figure 4-91 PCM Segments for a Three-Cabinet System

Static traffic capacity

The static traffic capacity of the HiPath 3750 and HiPath 3700 systems can be determined as follows.

Table 4-17 HiPath 3750 and HiPath 3700 - Static Traffic Capacity

HiPath 3750 HiPath 3700	**Slots per PCM segment**	**Static traffic capacity per PCM segment**	**Total static traffic capacity of the system**
Single-cabinet system (see Figure 4-89)	02 + 03	64 erlangs	192 erlangs
	04 + 05	64 erlangs	
	06 + 07 + 08	64 erlangs	
Two-cabinet system (see Figure 4-90)	02 + 03	64 erlangs	448 erlangs
	04 + 05	64 erlangs	
	06 + 07 + 08	64 erlangs	
	10 + 11	64 erlangs	
	12 + 13	64 erlangs	
	14 + 15	64 erlangs	
	16 + 17	64 erlangs	
Three-cabinet system (see Figure 4-91)	02 + 03	64 erlangs	448 erlangs
	04 + 05	64 erlangs	
	06 + 07 + 08	64 erlangs	
	10 + 11 + 19 + 20	64 erlangs	
	12 + 13 + 21 + 22	64 erlangs	
	14 + 15 + 23 + 24	64 erlangs	
	16 + 17 + 25 + 26	64 erlangs	

4.3.6.1 Inserting or Removing Boards

Introduction

Peripheral boards can be inserted and removed while the power is connected. Two levers are attached to the front corners of the boards to simplify insertion and removal. When closed, these levers engage with the board, locking it in place.
See Section 9.2.2 for information on upgrading peripheral boards.

Procedure for inserting and removing the boards (Figure 4-92)

If	Then
Boards Unlocking the board (1)	Swing both plastic levers outward simultaneously. You can now pull the board out of the system on its guide rails.
Boards Latching assembly (2)	Slide the board into the system using its guide rails. Insert the hooks on the locking levers into the recesses in the shelf. Press down on both levers simultaneously in the direction of the shelf until they snap into place.

Locking and Unlocking Boards

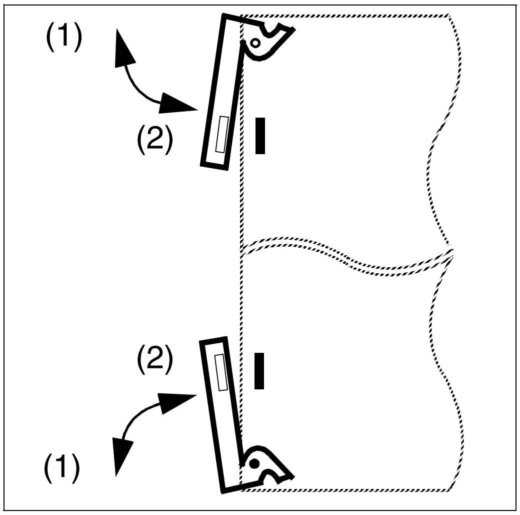


Figure 4-92 Locking and unlocking boards

Special board attachments

The power supply is screwed onto the grill of each cabinet.

The special REAL board is mounted on the metal back panel (basic cabinet only) and connected to the backplane with a ribbon cable.

4.3.7 Connecting Workpoint Clients

For information, see Chapter 10.

4.3.8 Making trunk connections

Refer to the following board descriptions for information:

- STMD8 (S_0 trunk connection)
- TMS2 (Not for U.S.) (S_{2M} trunk connection)
- TMAMF (for selected countries only)
- TML8W (Not for U.S.) (MSI)
- TIEL
- TMDID8 (for U.S. only)
- TMGL8 (for U.S. only)
- TMST1 (for U.S. only)

4.3.9 Performing a Visual Inspection

Introduction

Before starting up the system, you must perform a visual inspection of the hardware, cables, and the power supply. The procedure is shown in Table 4-18. The visual inspection must be performed while the system is disconnected from the power supply.

> **Caution**
> Before beginning work, make sure that the system is grounded and disconnected from the power supply.
> Observe the measures for protecting electrostatically sensitive devices (see Page 1-9).

Visual Inspection Procedure

Table 4-18 Visual Inspection Procedure

Step	Activity	Resources/ Remarks	Action
1.	Compare the slots for the installed boards with the board assignment map.	Board assignment map	Correct the board configuration and notify the sales department.
2.	Check all boards for proper seating.	See Page 4-160 Check the additional mechanical attachments for the UPSM.	Reconnect and fasten the boards.
3.	Check the local line voltage.	Digital multimeter	

> After finishing the visual inspection, you can begin starting up the HiPath 3750 or HiPath 3700 system as described in Chapter 5.

4.4 Installing HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300

4.4.1 Installation Prerequisites

> **Warning**
> Only authorized service personnel should install and start up the system.

Tools and resources needed

The following are needed for installing the HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300 systems:

- **Tools**:
  - Diagonal cutting pliers, telephone pliers, wire stripper, flat-nosed pliers
  - Slotted screwdrivers, from 2 to 8 mm (1/4 to 5/16 in.)
  - Phillips or cross-point screwdrivers, sizes 1 and 2
  - TORX screwdriver
  - Electric drill, hammer
  - Level, tape measure
  - For U.S. only: Punch-down tool suitable for the block used (such as block 66)
- **Resources**:
  - Assistant T or HiPath 3000 Manager E
  - Digital multimeter for testing ground connections and partial voltages
  - Telephone test set for analog interfaces
  - Not for U.S.: ISDN tester (such as K3000 or Aurora)
  - For U.S. only: Aurora$^{\text{Duet}}$, Aurora$^{\text{Expert,}}$ Aurora$^{\text{Remote}}$ or similar, ISDN protocol analyzer

4.4.2 Installation Procedure

Table 4-19 HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 - System Installation Procedure

Step	Installation Activity	
	Installing HiPath 3550 and HiPath 3350	**Installing HiPath 3500 and HiPath 3300 (19-Inch Housing)**
1.	Selecting the Installation Site, page 4-165 (usually predetermined)	Selecting the Installation Site, page 4-187 (usually predetermined)
2.	Unpacking the Components, page 4-168	Unpacking the Components, page 4-188
3.	Not for U.S.: Mounting the Main Distribution Frame (HiPath 3550 only), page 4-168	Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall, page 4-189
4.	Removing the System Housing Cover, page 4-170	Installing a HiPath 3500 or HiPath 3300 in a Cabinet, page 4-190
5.	Attaching the System to the Wall, page 4-172	Grounding the System, page 4-192
6.	Grounding the System and the Main Distribution Frame, page 4-173	Installing the Boards, page 4-193
7.	Installing the Boards, page 4-175	Connecting Cables and the Line Network, page 4-194
8.	Laying the Line Network and Connection Cables, page 4-176	Configuration notes, page 4-195
9.	Attaching Ferrite, page 4-179	Connecting Workpoint Clients, page 4-198
10.	Configuration notes, page 4-181	Making trunk connections, page 4-198
11.	Connecting Workpoint Clients, page 4-185	Performing a Visual Inspection, page 4-198
12.	Making trunk connections, page 4-185	
13.	Performing a Visual Inspection, page 4-185	

4.4.3 Installing HiPath 3550 and HiPath 3350

This section contains information on how to install HiPath 3550 and HiPath 3350. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment and expansions.

4.4.3.1 Selecting the Installation Site

Selecting a site

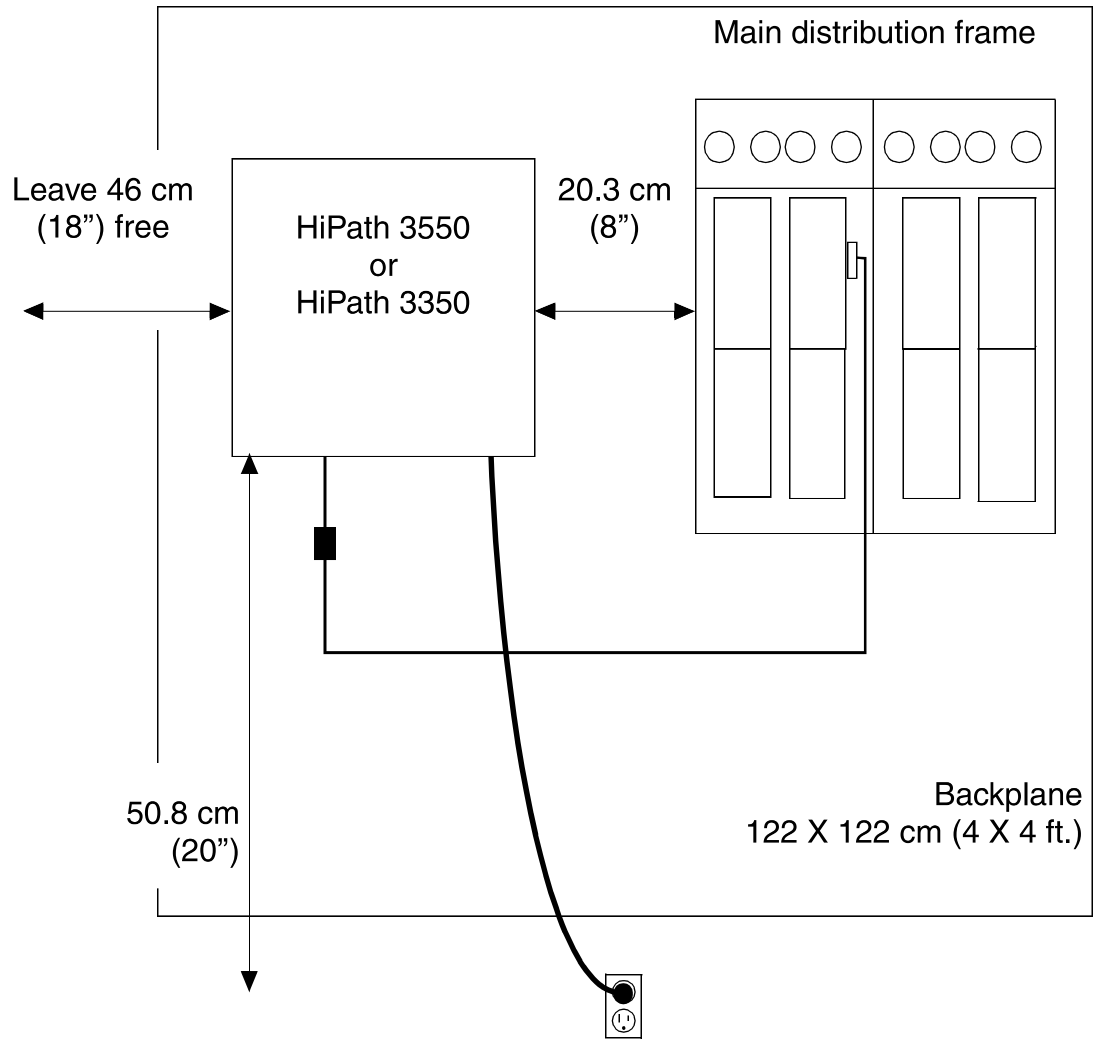
The customer usually has a preferred installation site in mind.

Make sure that the customer's site meets the following guidelines:

- To guarantee sufficient system ventilation, keep the area surrounding the housing clear as follows: allow 30 cm clearance on the left (for board replacement), and 10 cm clearance on the right, top and bottom of the housing.
- Do not expose the systems to direct sources of heat (for example sunlight and heaters).
- Do not expose the systems to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.9.

For U.S. Only:

- Ensure that the installation site is in the immediate vicinity of an electrical outlet
- Allow space for a main distribution frame or other additional equipment.
- Install lightning and surge arrester equipment.
- Avoid standard carpeting, as it tends to produce electrostatic charges.
- Ensure that Siemens equipment is 40 in. (101.6 cm) from other electrical equipment. The National Electrical Code (NEC) requires 36 in. (91.44 cm) of clearance in front of electrical equipment and 40 in. (101.6 cm) of clearance from other electrical service equipment.
- Ensure that the equipment room for the system provides adequate space for installation and maintenance activities, including removing and replacing the cover). See Figure 4-93 for space requirements on the sides of the system. We recommend using a plywood backboard at least 0.5 in. (127 mm) thick and measuring at least 4 ft. (122 cm) by 4 ft. (122 cm.).


Main distribution frame
Leave 46 cm
(18”) free
HiPath 3550
or
HiPath 3350
20.3 cm
(8”)
50.8 cm
(20”)
Backplane
122 X 122 cm (4 X 4 ft.)

The system measures 18 by 17.7 inches (46 x 45 cm). The following spaces should be allowed: 18 in. (46 mm) of clearance on the left, and at least 8 in. (203 mm) of clearance on the top and right. Allow 20 in. (50.8 cm) of clearance on the bottom (for cables).

Figure 4-93 HiPath 3550 and HiPath 3350 - Space Requirements (for U.S. only)

You will find information on the design and dimensions in the following section:

- HiPath 3550 Section 2.2.2.3
- HiPath 3350 Section 2.2.2.4

4.4.3.1.1 For U.S. only: AC outlet

The AC connection must fulfill the requirements specified in Table 4-20.

Table 4-20 Electrical Connection Values (for U.S. only)

Nominal voltage	**Nominal voltage range**		**Nominal Frequency Range**		**Wall Outlet Configurations**
	from	**to**	**from**	**to**	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

AC Power Outlet Requirements

- The power source may not be more than 2 m (6 ft.) from the system.
- The power source must supply a voltage of 120 V AC (single phase, fused) in 50-60 Hz.
- A warning should be attached to the circuit breaker to prevent accidental removal of power.
- An independent electric circuit with an isolated ground conductor should be used.
- Recommendation: Add a power surge protector between the outlet and the system.

4.4.3.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.

⚠ **Caution**
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.4.3.3 Not for U.S.: Mounting the Main Distribution Frame (HiPath 3550 only)

Introduction

MDFU is the main distribution frame used (see Figure 4-94).

Installation notes

The MDFU-E main distribution frame should be installed in the direct vicinity of the system (note length of connection cable) and at eye level. Mount it on the wall according to the instructions that came with it. The bag attached to the cover contains a drill template. It also contains the necessary screws and wall anchors for attaching the MDF to the wall.

The MDFU must be grounded. Refer to Section 4.4.3.6 for an explanation of the procedure.

Procedure for mounting the MDFU on the wall

Step	Activity
1.	Use the template to drill the holes.
2.	Insert the wall anchors and screw in the screws, leaving 5 mm projecting.
3.	Remove the housing cover and mount the MDFU-E on the brackets.
4.	Tighten the screws through the holes.

Layout and dimensions of the MDFU

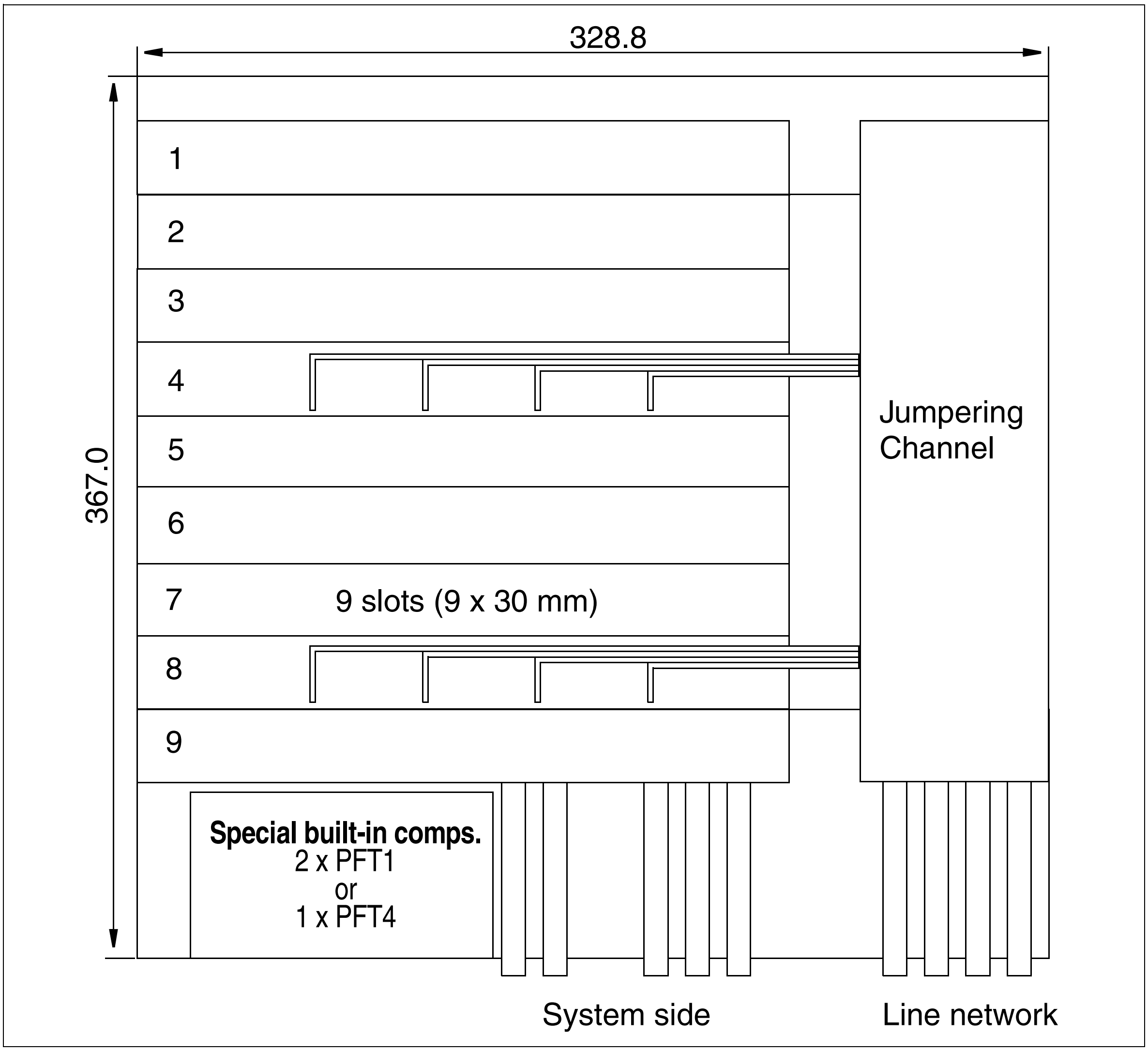
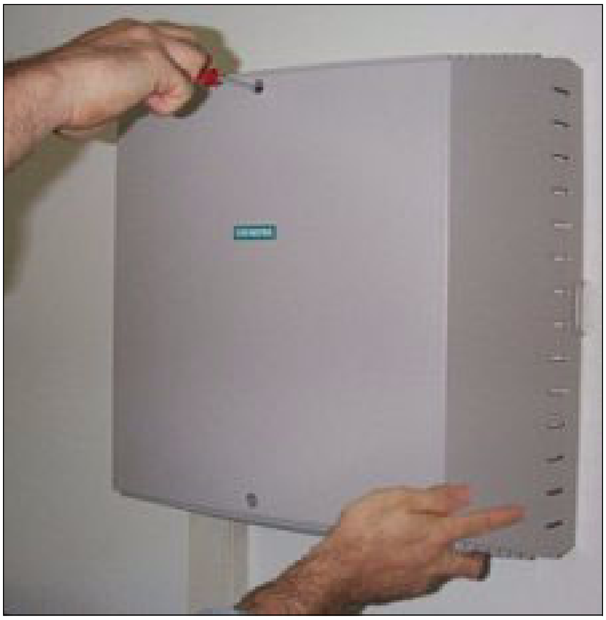

328.8
367.0
1
2
3
4
5
6
7
8
9
9 slots (9 x 30 mm)
Jumpering
Channel
Special built-in comps.
2 x PFT1
or
1 x PFT4
System side
Line network

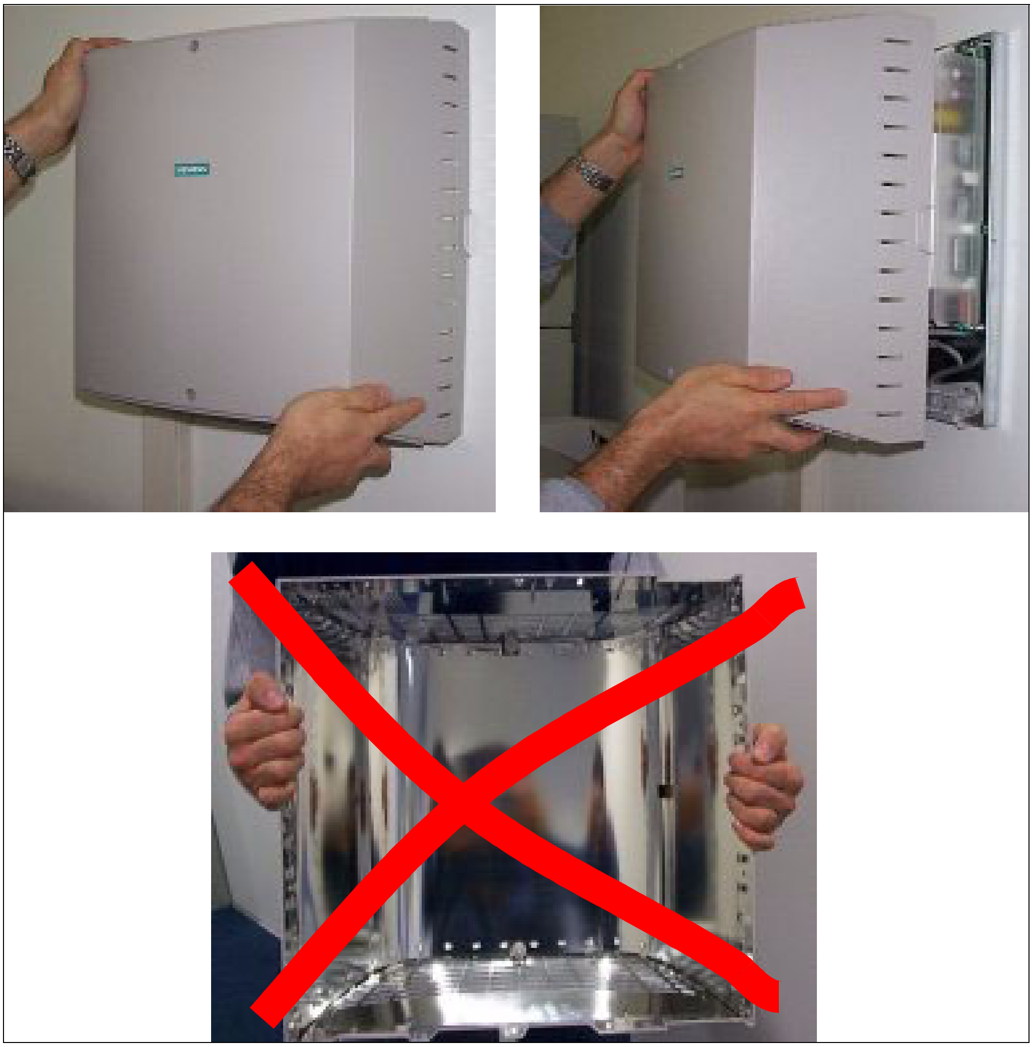
Figure 4-94 MDFU - Layout and Dimensions (367.0 x 328.8 x 125.4 mm) (not for U.S.)

4.4.3.4 Removing the System Housing Cover

⚠ **Warning**
To prevent injuries, you must observe the following instructions for the removal and attachment of the HiPath 3550 and HiPath 3350 housing cover.

Procedure

Step	Activity
1.	Loosen the two screwed plugs on the housing cover with a slotted screw driver. Hold the housing cover so that it does not fall. 

Step	Activity
2.	Remove the housing cover. **Warning** **Grasp the housing cover by its outside walls only.** The shielding plate on the inside of the cover may have sharp edges which can cause cuts. 

Mounting the housing cover

To close the system housing again, put the cover on and fasten it with the two screwed plugs. To avoid injuries, grasp the housing cover by its outside walls only when mounting it.

4.4.3.5 Attaching the System to the Wall

Attach the system to the wall as shown in Figure 4-95.

Attaching the HiPath 3550 and HiPath 3350 housing to the wall

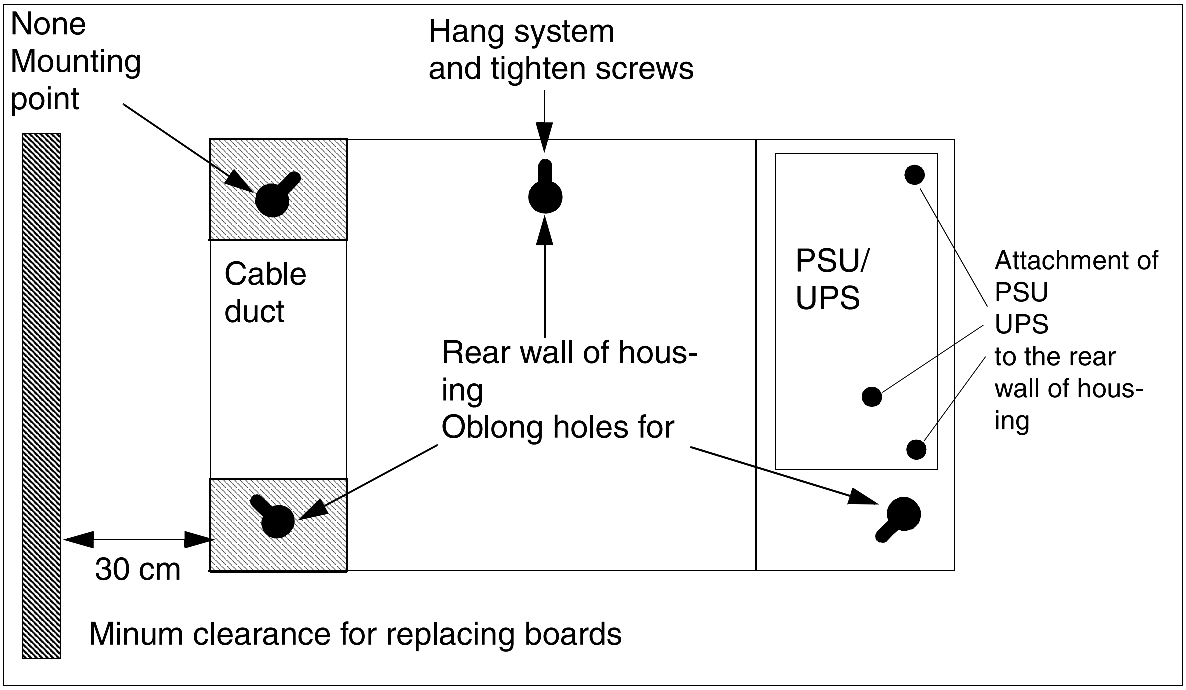

None
Mounting
point
Hang system
and tighten screws
Cable
duct
PSU/
UPS
Attachment of
PSU
UPS
to the rear
wall of housing
Rear wall of housing
Oblong holes for
30 cm
Minum clearance for replacing boards

Figure 4-95 HiPath 3550 and HiPath 3350 - Wall Attachment

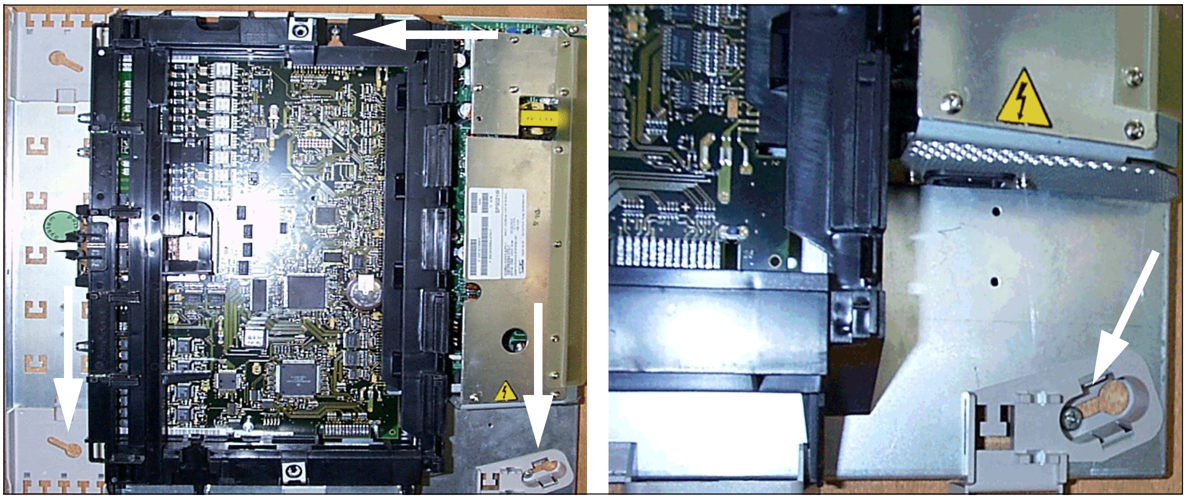


Figure 4-96 HiPath 3550 and HiPath 3350 - Wall Attachment

4.4.3.6 Grounding the System and the Main Distribution Frame

Not for U.S.: Grounding of the System

> Because of their safety class, the HiPath 3550 and HiPath 3350 do not have to be grounded.
> If grounding is required in certain countries (for example in Finland, Norway, U.S.), the wall housing HiPath 3550 and HiPath 3350 must be grounded by a separate ground conductor via the ground connection marked "⏚".

For U.S. and Canada only: Grounding the system

The connector cables of systems HiPath 3550 and HiPath 3350 have a grounding. The system must also be grounded by a separate ground conductor. This grounding connection must meet the requirements of the relevant authorities (U.S. National Electrical Code, Canadian Electrical Code). Lay a separate grounding from the earth to the system's grounding connector. The cross-section of the grounding must measure at least 14 AWG.

Grounding for the external main distributor frame

- Not for U.S.:
  - HiPath 3550: Shipments always include an MDFU (Germany only) and two grounding cables. Use one of the cables to ground the MDFU. It is not necessary to ground the connection between the MDFU and HiPath 3550 (see Figure 4-97).
  - HiPath 3350: This system type does not require an external main distribution frame. The connection cables to the peripherals are attached directly to the boards and routed to the outside via a cable duct inside the housing.

> **Danger**
> An external main distribution frame which requires grounding (if the existing ground connection is marked "⏚") must be grounded by a separate ground conductor (minimum cross-section = 2.5 mm^2)
> Failure to follow these instructions can result in electrical shock.

Refer to Figure 4-97 when replacing a customer system but maintaining the existing external main distribution frame.

- For U.S. only:

The customer supplies a main distribution frame to complete the communications system. Mount and ground the MDF in accordance with the manufacturer's instructions.

Grounding an external main distribution frame

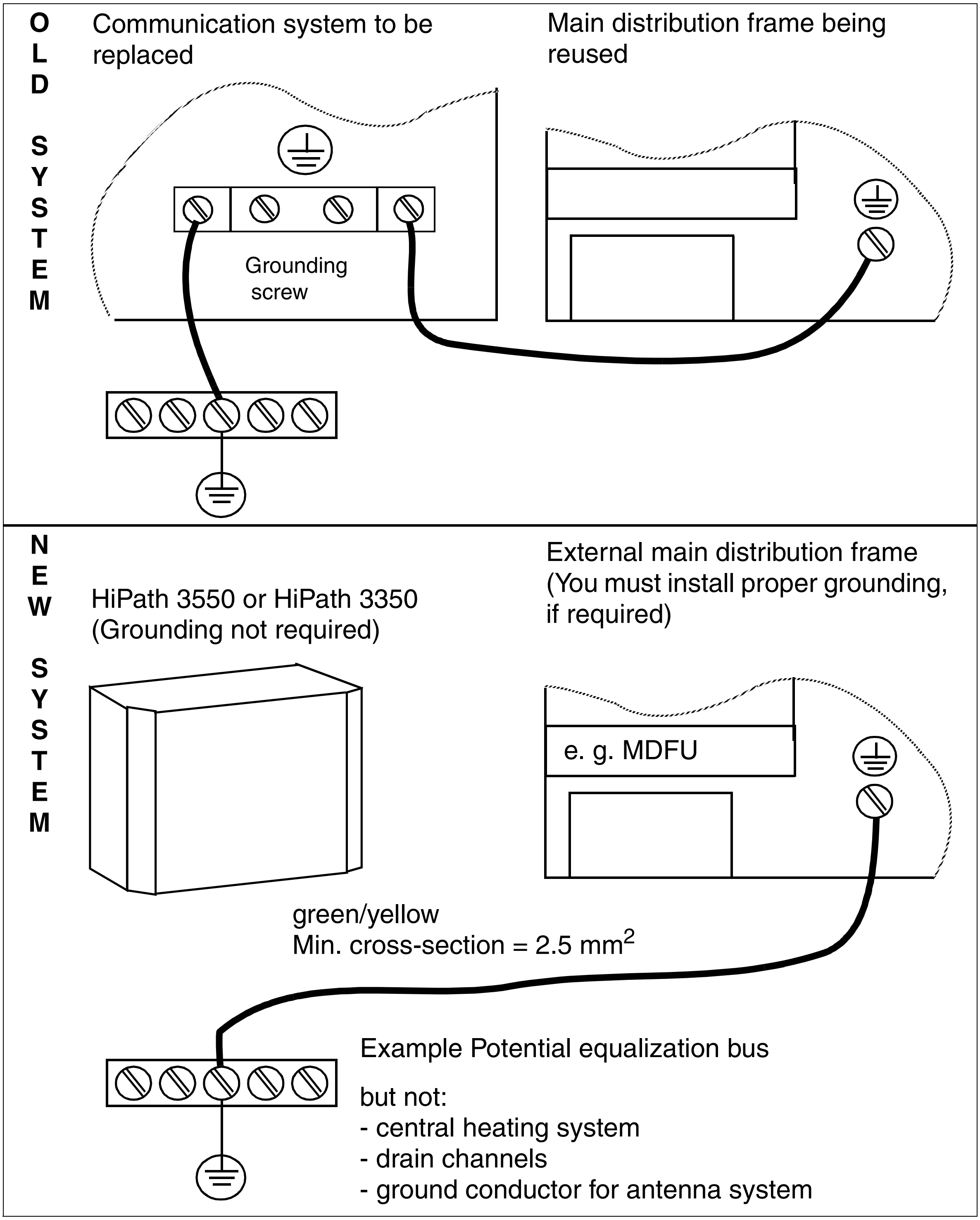

OLD SYSTEM
Communication system to be replaced
Main distribution frame being reused
Grounding screw
NEW SYSTEM
HiPath 3550 or HiPath 3350
(Grounding not required)
External main distribution frame
(You must install proper grounding, if required)
e. g. MDFU
green/yellow
Min. cross-section = 2.5 mm²
Example Potential equalization bus
but not:
- central heating system
- drain channels
- ground conductor for antenna system

Figure 4-97 HiPath 3550, HiPath 3350 - Grounding an External Main Distribution Frame

4.4.3.7 Installing the Boards

Outside the U.S., the system is already equipped with the boards needed for the customer-specific requirements when the system is delivered.

In the U.S., you may need to install the boards.

Connecting to T1, PRI, or CorNet (for U.S. only)

> ⚠ **Caution**
> The TST1 Module (HiPath 3550) can be installed only in conjunction with a listed channel service unit (CSU).

4.4.3.8 Laying the Line Network and Connection Cables

HiPath 3550 and HiPath 3350 - CABLU for connection to the external main distribution frame

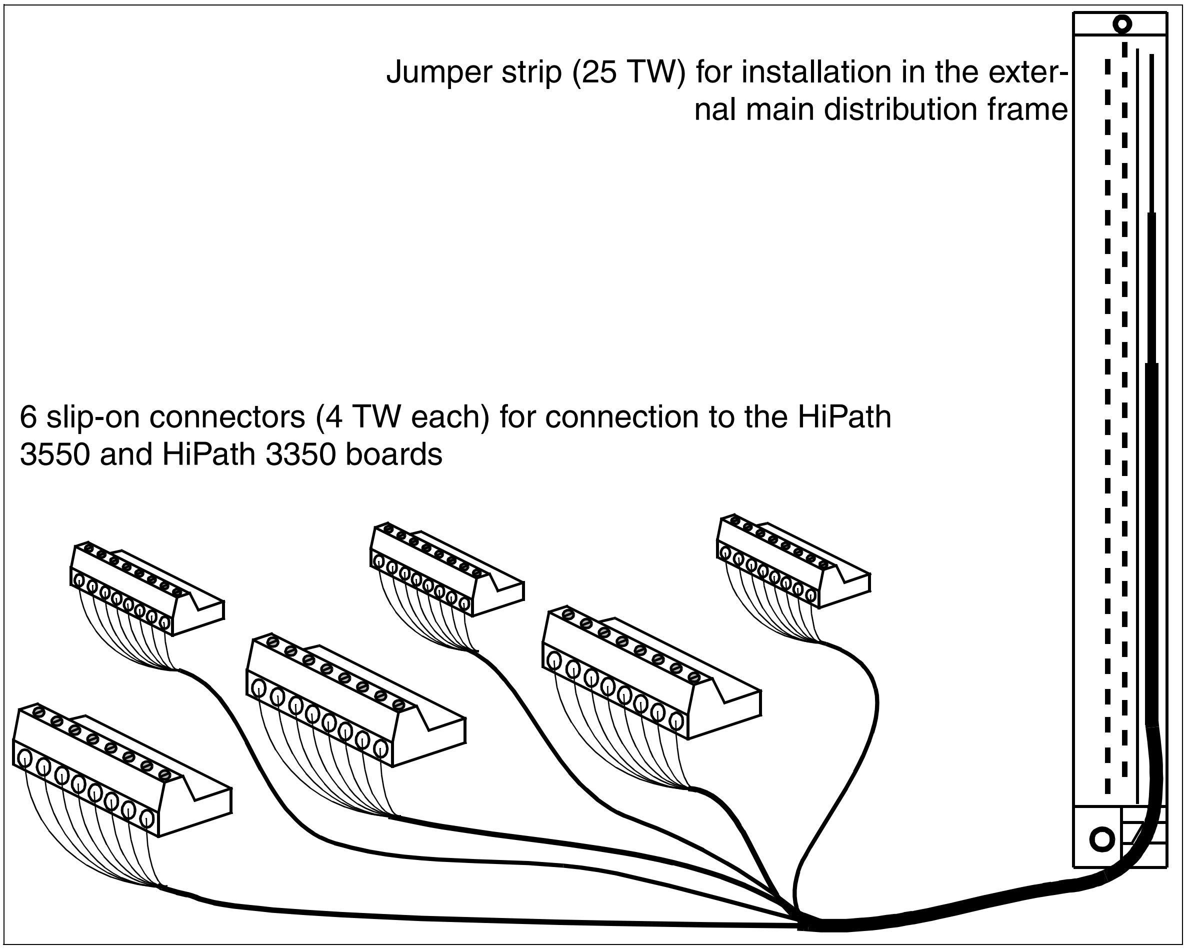
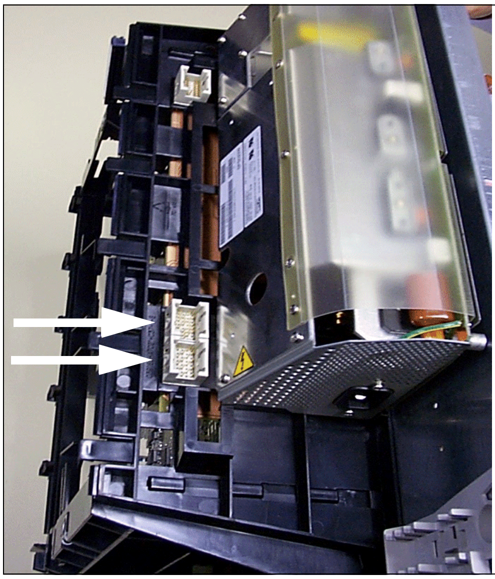

Jumper strip (25 TW) for installation in the external main distribution frame
6 slip-on connectors (4 TW each) for connection to the HiPath 3550 and HiPath 3350 boards

Figure 4-98 Layout of CABLU S30269-Z41-A30 (Length = 3 m)

HiPath 3550 - MDFU ports for peripheral boards in HiPath 3750 format



The two arrows on the left mark the connections for the cables coming from the main distribution frame (MDFU).

Figure 4-99 HiPath 3550 - Backplane Connection for a Peripheral Board in HiPath 3750 Format

Not for U.S.: HiPath 3550: Connecting the Cabling

If	Then
SLA8N SLA16N SLA24N SLC16 SLC16N SLMO24	Route the 16 TW to the MDFU via the SU X8 and 8 TW via SU X9 (see Figure 4-99) using a standard cable (with 16 TW). Connect both cables (= 1 CABLU with SU connectors labeled 8 and 9) to the same jumper strip (25 TW).
Slot with any other peripheral board	● Without an external main distribution frame (MDFU): You can attach cables for the peripheral boards directly to the boards (see Figure 4-100 for the slip-on connectors) and route them to the MDFU through the cable duct inside the housing. ● With an external main distribution frame (MDFU): Use CABLU S30269-Z41-A30 (Figure 4-98) to connect the peripheral boards to the customer's line network. As shown in Figure 4-100, you can connect the eight-pin slip-on connectors to the boards directly. The line network connects directly to the jumper strip.

Not for U.S.: HiPath 3350: Connecting the Cabling

The **integrated distribution frame** in HiPath 3350 allows you to connect the cable network to the trunk and the stations using screw connections on slip-on connectors. that can be easily removed for easy system connection and disconnection.

The peripheral boards and optional boards contain a distribution frame component in the form of edge connectors on the boards.
The slip-on connectors for these edge connectors are supplied with the boards.

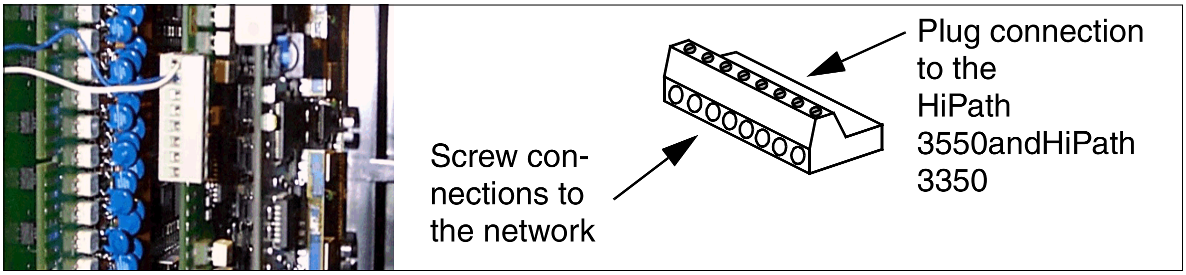

Plug connection to the HiPath 3550andHiPath 3350
Screw con-nections to the network

Figure 4-100 Integrated Distribution Frame - Slip-On Connector Screw Connections

If you have an **external main distribution frame** (MDFU), use CABLU S30269-Z41-A30 (Figure 4-98) to connect the peripheral boards to the customer’s line network. As shown in Figure 4-100, you can connect the 8-pin slip-on connectors directly to the boards. The line network connects directly to the jumper strip.

For U.S. only: HiPath 3550 and HiPath 3350: Connecting the Cabling

If the boards are not already connected to the appropriate cables leaving the system, you need to connect them.

- The TST1 Module (HiPath 3550) connects to a customer-supplied channel service unit (CSU) using the supplied cable. The CSU provides the required secondary protection.
- Each port on the STLS4 Module connects to an S_0 bus using the supplied, silver-satin connector cord and a surface-mounted RJ21X jack. The surface-mounted RJ21X jack is not supplied.

  The signals must be reversed in the RJ45X jack. See Figure 3-76.
- The board in Slot 10 of HiPath 3550 connects using a special cable from the backplane to the main distribution frame (MDF).
- The remaining peripheral boards and options are connected by means of a mains distributor provided on the customer side or a comparable unit. This is where the MDF cables supplied are used (Octopus cable with Amphenol terminators). You select the output pattern on the Amphenol connector by which slip-on connector you use on each board edge connector.

- Note: The MDF cable reverses the signals coming from the board. This means that R/T on the board interface becomes T/R on the Amphenol connector.

4.4.3.9 Attaching Ferrite

To keep within the interference limit required by EMC Class B, you must attach ferrite to the following lines.

HiPath 3550 and HiPath 3350 power cables (wall housing)

The wall housing’s power cable must be guided through the C39022-Z7000-C7 ferrite sleeve that is included in the accessory pack. Position the ferrite sleeve as shown in Figure 4-101 so that you will be able to close the housing cover.

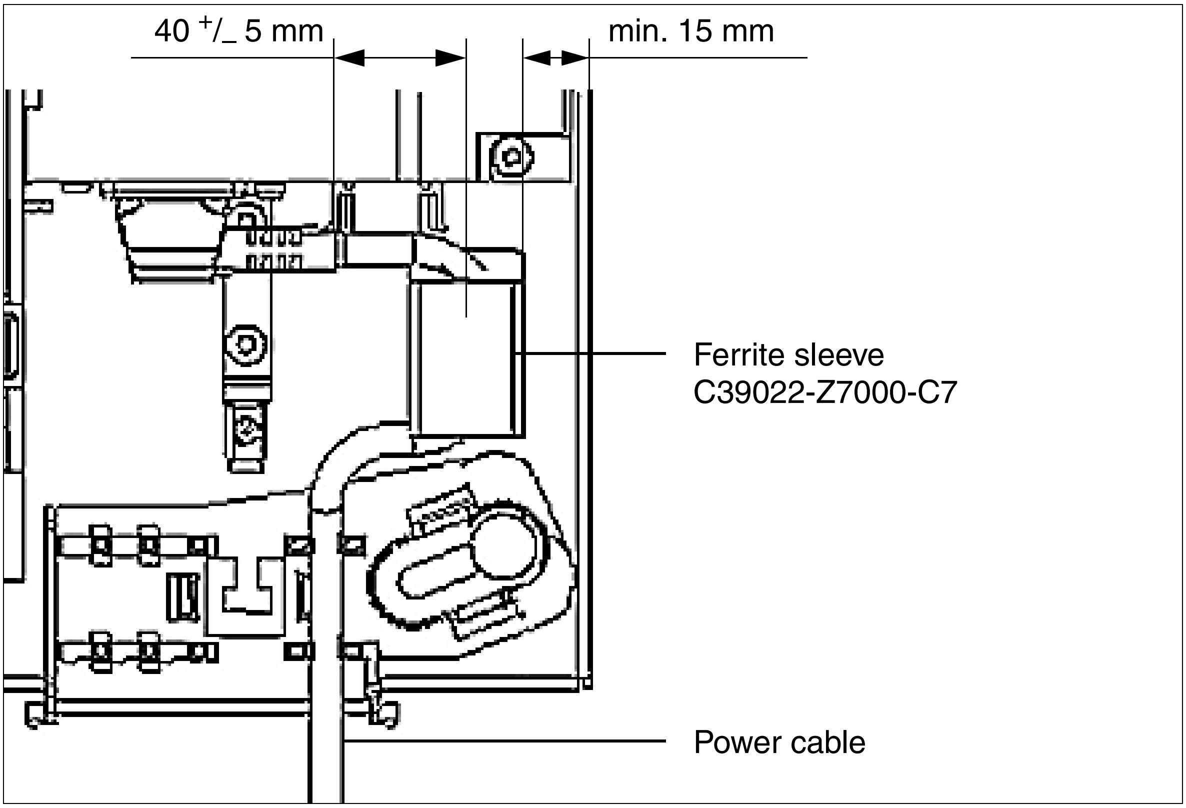


Figure 4-101 HiPath 3550 and HiPath 3350 - Power Cable with Ferrite Sleeve

Digital and analog trunks and subscriber lines from HiPath 3550 (wall housing)

The accessory pack does not contain enough ferrite sleeves for all trunks and subscriber lines possible in a maximum system configuration. In this case, you will need to order additional ferrite.

If	Then
Trunk board or subscriber line modules in HiPath 3750 format	Guide both standard cables from SU X8 and SU X9 (see Figure 4-99) to the MDFU through two ferrite sleeves (C39022-Z7000-C7) each. The ferrite should be placed as far inside the housing as possible.
Trunk or subscriber line modules in “small” format	Guide the trunk and subscriber lines of all ports connected on a board through a ferrite sleeve twice, i.e. in a loop. The ferrite should be fixed in the cable duct if possible. If the number of lines makes this impossible, the ferrite can be attached directly at the output of the cable duct.

4.4.3.10 Configuration notes

Restrictions for equipment with IVMP8, IVMS8, TST1 and TS2 boards must be observed.

HiPath 3550: system overview and slots

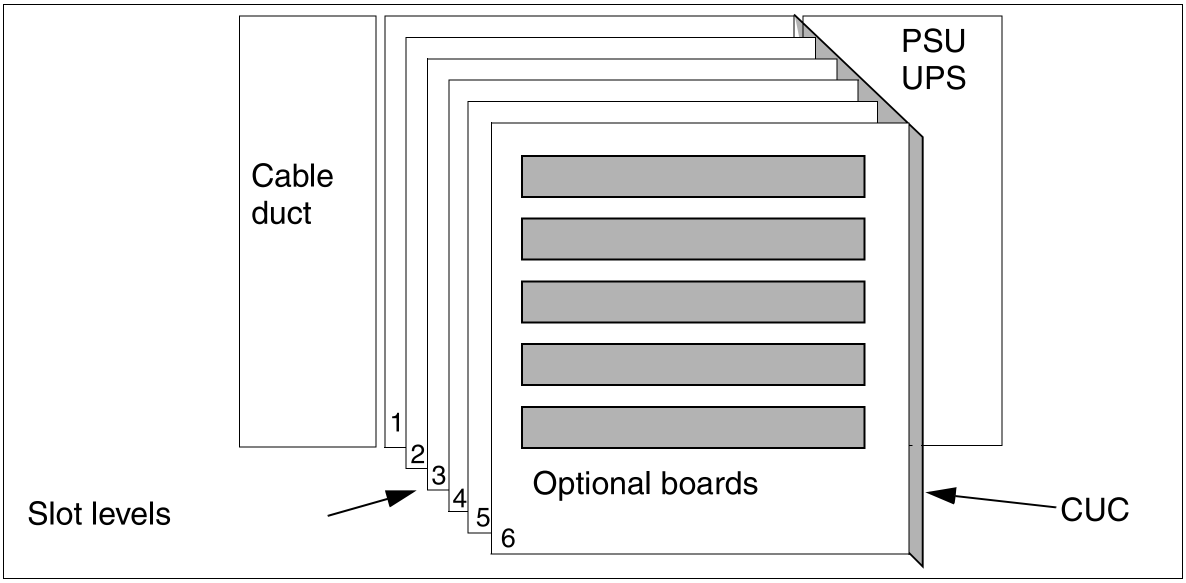

Cable duct
PSU
UPS
1
2
3
4
5
6
Optional boards
Slot levels
CUC

Figure 4-102 HiPath 3550 - Wall Housing System Overview

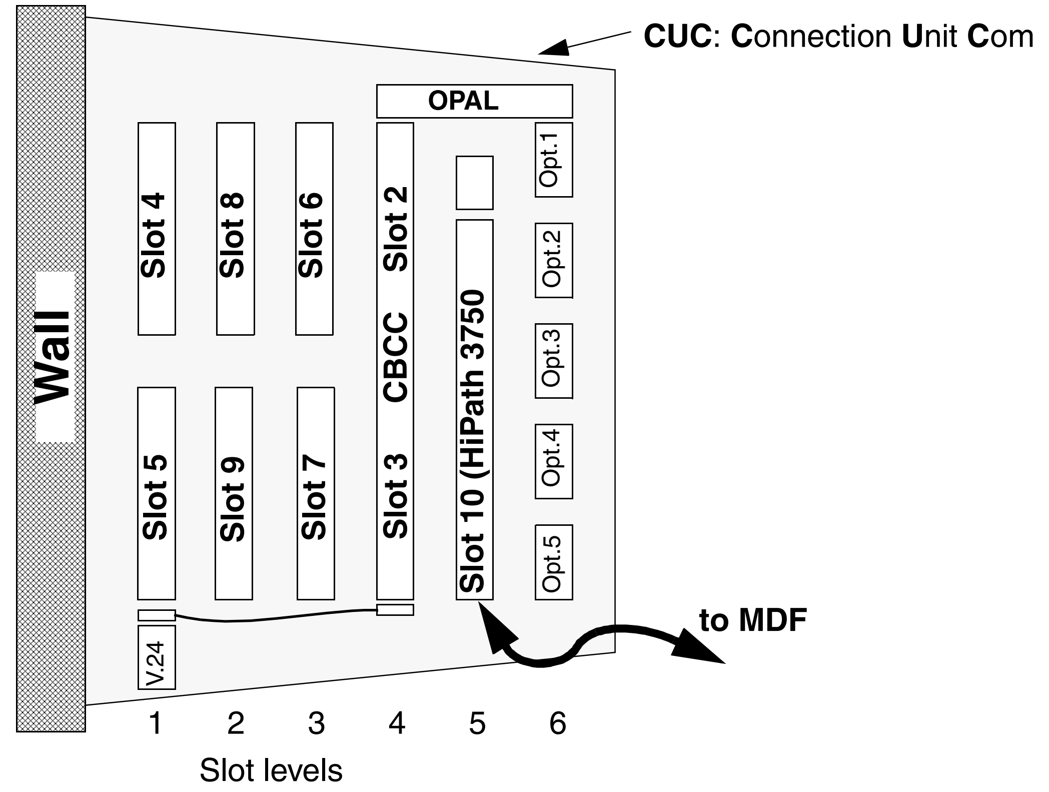
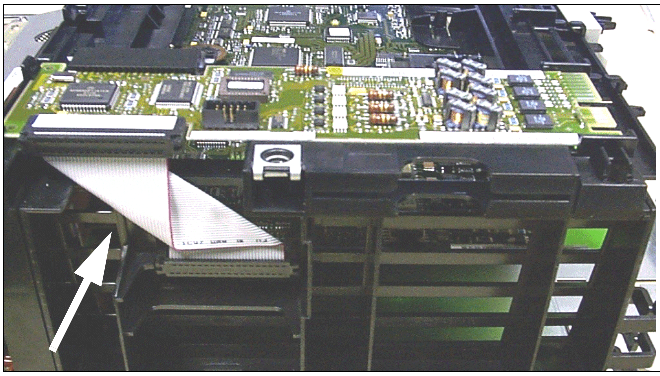

CUC: **C**onnection **U**nit **C**om
OPAL
Wall
Slot 4
Slot 8
Slot 6
CBCC Slot 2
Slot 5
Slot 9
Slot 7
Slot 3
Slot 10 (HiPath 3750
Opt.1
Opt.2
Opt.3
Opt.4
Opt.5
V.24
to MDF
1
2
3
4
5
6
Slot levels

Figure 4-103 HiPath 3550 - Slots in the Wall Housing



The CBCC board is connected to the optional board via a ribbon cable (OPAL) (see adjacent figure).

Figure 4-104 HiPath 3550 - Option Adapter Long (OPAL)

HiPath 3350: system overview and slots

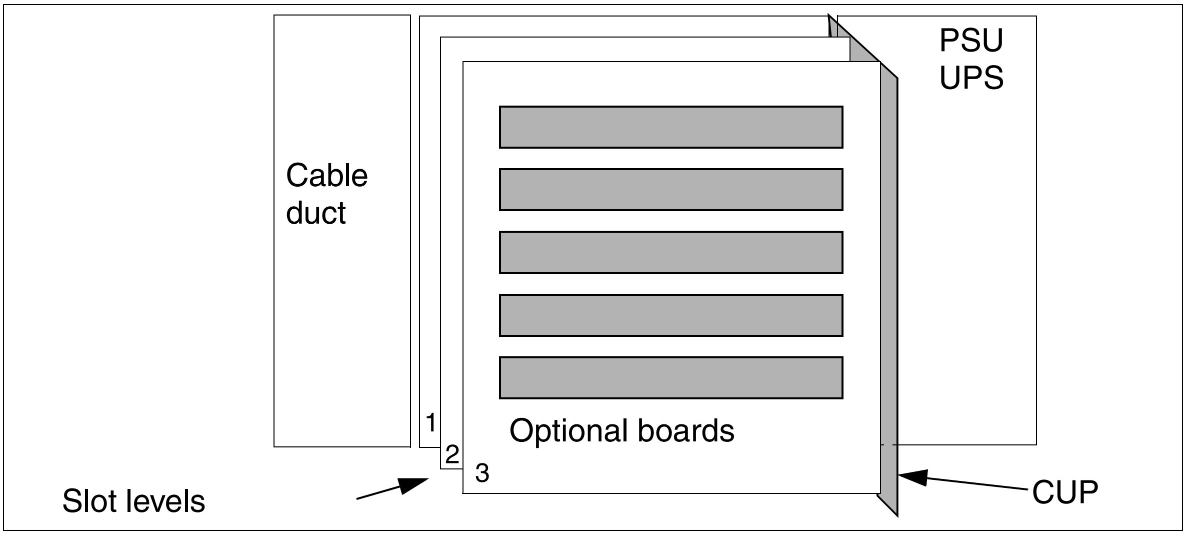

PSU
UPS
Cable duct
1
2
3
Optional boards
Slot levels
CUP

Figure 4-105 HiPath 3350 - Wall Housing System Overview

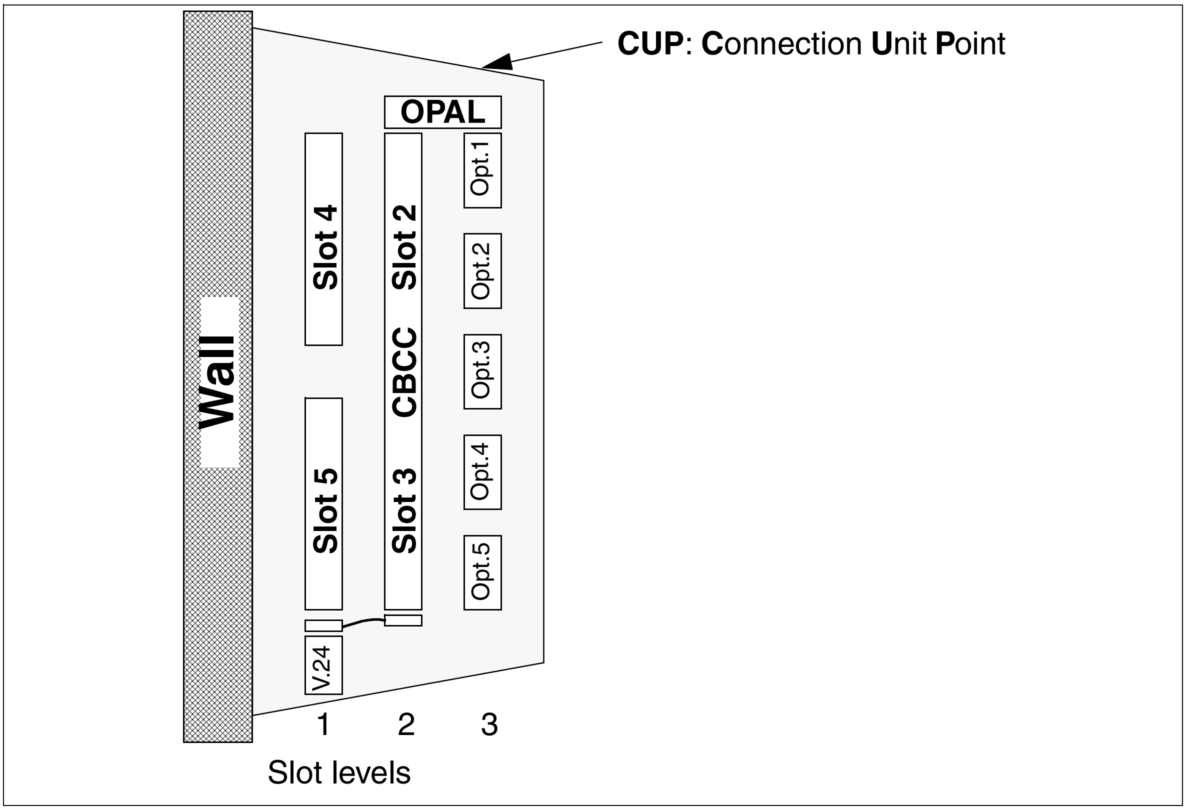

CUP: **C**onnection **U**nit **P**oint
Wall
OPAL
Slot 4
Slot 5
Slot 2
CBCC
Slot 3
Opt.1
Opt.2
Opt.3
Opt.4
Opt.5
V.24
1
2
3
Slot levels

Figure 4-106 HiPath 3350 - Slots in the Wall Housing

Static traffic capacity

The HiPath 3550 and HiPath 3350 systems have the following static traffic capacities.

Table 4-21 HiPath 3550 and HiPath 3350 - Static Traffic Capacity

System	Slots	Static traffic capacity	Total static traffic capacity of the system
HiPath 3550 (see Figure 4-103)	2 / 3 (CBCC)	24 erlangs	198 erlangs
	4	16 erlangs	
	5	16 erlangs	
	6	16 erlangs	
	7	16 erlangs	
	8	16 erlangs	
	9	30 erlangs[1]	
	10	64 erlangs	
HiPath 3350 (see Figure 4-106)	2 / 3 (CBCC)	24 erlangs	56 erlangs
	4	16 erlangs	
	5	16 erlangs	

[1] Use of a TS2 board results in a capacity of 30 erlangs. A maximum of one TS2 per HiPath 3550 is possible, and the board may only be installed in slot 7 or 9, thus resulting in 30 Erlangs for slot 7 or 9.

4.4.3.11 Connecting Workpoint Clients

For information, see Chapter 10.

4.4.3.12 Making trunk connections

Refer to the following board descriptions for information:

- STLS2 (Not for U.S.), STLS4 (S_0 trunk connection)
- TS2, HiPath 3550 only (S_{2M} trunk connection)
- TLA2 (Not for U.S.), TLA4 (Not for U.S.), TLA8 (Not for U.S.) (MSI)
- TMAMF (for selected countries only), HiPath 3550only
- TMGL4 (for U.S. only)
- TMQ4 (for U.S. only)
- TST1 (for U.S. only), HiPath 3550only

4.4.3.13 Performing a Visual Inspection

Before starting up the system, you must perform a visual inspection of the hardware, cables, and the power supply. The visual inspection must be performed while the system is disconnected from the power supply.

> **Caution**
> Conduct the visual inspection only while the system is disconnected from the power supply.
> Always wear an antistatic wristband and observe the measures for protecting electrostatically sensitive devices (see Page 1-9).

Step	Activity	Resources/Remarks	Possible remedies
1.	Compare the slots for the installed boards with the board assignment map.	Board assignment map	Correct the board configuration and notify the sales department.
2.	Check the local line voltage.	Digital multimeter	

> After finishing the visual inspection, you can begin starting up the system as described in Chapter 5.

4.4.4 Installing HiPath 3500 and HiPath 3300 (19-Inch Housing)

This section contains information on how to install the HiPath 3500 and HiPath 3300 19-inch housing. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment and expansions.

Danger
The HiPath 3500 and HiPath 3300 systems can only be operated with a closed housing.
Before opening the housing, make sure that the system is de-energized as follows:

- Disconnect the line cord on any connected battery pack (for UPSC-DR only).
- Disconnect the line cord on any connected EPSU2-R (for UPSC-DR only).
- Disconnect the power plug.

4.4.4.1 Installation Versions

HiPath 3500 and HiPath 3300 are designed for the following three installation variants:

- Wall mounting (with assembly kit 39165-A7027-D2)
- Desk installation (assembly kit includes adhesive feet 39165-A7027-D2.)
  Stick the adhesive feet to the bottom of the housing.
- Installation in the 19-inch cabinet (with assembly kit 39165-A7027-D1 for HiPath 3500, assembly kit 39165-A7027-D4 for HiPath 3300)

You can also install an ECR expansion cabinet rack in which you can install a battery pack (for uninterruptible power supply) and/or an additional external power supply EPSU2-R (if the system's internal power supply is not sufficient) (see Section 9.2.4).

4.4.4.2 Selecting the Installation Site

Selecting a site

The customer usually has a preferred installation site in mind, for example an existing 19-inch cabinet.

Make sure that the customer's site meets the following guidelines:

- To guarantee sufficient system ventilation, allow a minimum of 10 cm clearance around the housing.
- Do not expose the systems to direct sources of heat (for example sunlight and heaters).
- Do not expose the systems to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.9.

You will find information on the design and dimensions in the following section:

- HiPath 3500 Section 2.2.2.6
- HiPath 3300 Section 2.2.2.7

4.4.4.2.1 For U.S. only: AC outlet

The AC connection must fulfill the requirements specified in Table 4-22.

Table 4-22 Electrical Connection Values (for U.S. only)

Nominal voltage	Nominal voltage range		Nominal Frequency Range		Wall Outlet Configurations
	from	to	from	to	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

4.4.4.3 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.

⚠ **Caution**
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.4.4.4 Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall

Procedure for wall mounting (Figure 4-107)

Step	Activity
1.	Drill a hole in the selected wall, insert a wall anchor and screw in the screws.
2.	Screw the angle brackets (A) and (B) for HiPath 3500 or HiPath 3300 onto the base of the device.
3.	Mount the system with the angle bracket (A) on the screws.
4.	Drill a second hole in the wall for the lower angle bracket (B), insert a wall anchor and attach the angle bracket with a screw.

Wall mounting

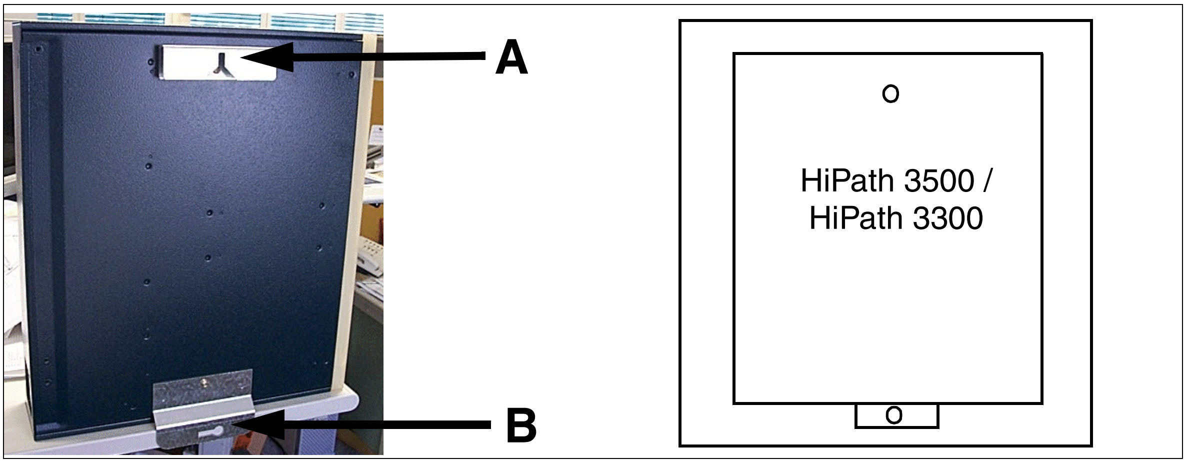


Figure 4-107 HiPath 3500 and HiPath 3300 - Wall Installation (for U.S.)

4.4.4.5 Installing a HiPath 3500 or HiPath 3300 in a Cabinet

Procedure for 19-inch cabinets (Figure 4-108)

Step	Activity
1.	HiPath 3500 only: Attach the two angle brackets (A) to the 19-inch cabinet using two screws per bracket.
2.	Attach the two angle brackets (B) to the left and right of the HiPath 3500 or HiPath 3300 using two screws per bracket.
3.	Slide the HiPath 3500 or HiPath 3300 system into the 19-inch cabinet and attach it to the left and right of the 19-inch frame with screws.

Mounting the 19-inch cabinet

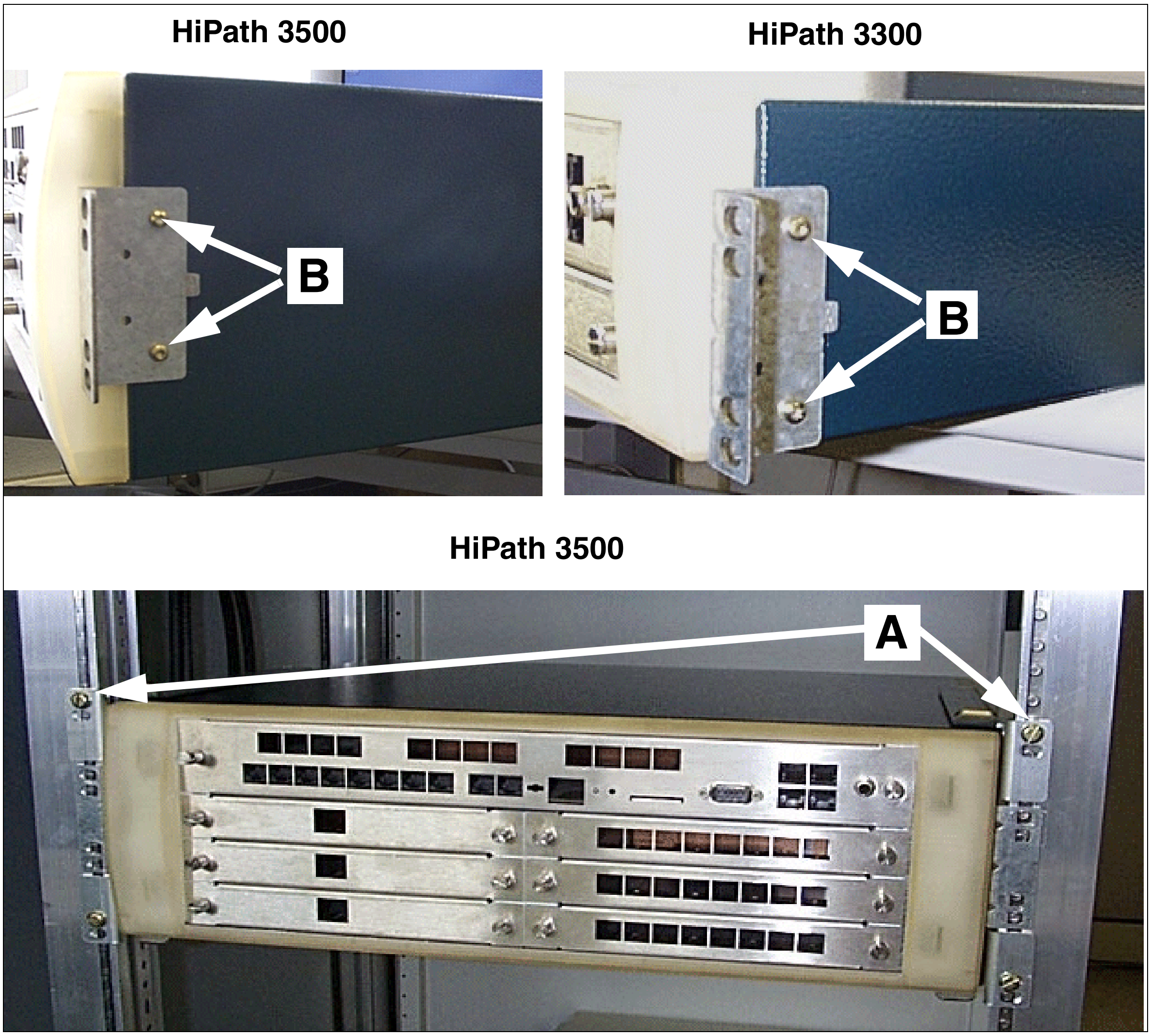

HiPath 3500
B
HiPath 3300
B
HiPath 3500
A

Figure 4-108 HiPath 3500 and HiPath 3300 - Mounting the 19-Inch Cabinet

4.4.4.6 Grounding the System

Grounding: Inspection and Implementation

Preliminary Inspection of the 19-Inch Cabinet:		
Is the 19-inch cabinet grounded by a separate **ground conductor** (green/yellow)?	**NO** ▶	The 19-inch cabinet must be grounded by a separate ground conductor (green/yellow). **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground.
YES ▼		
Does the 19-inch cabinet have a **potential equalization bus** at which the HiPath 3500 or HiPath 3300 can be grounded?	**NO** ▶	A potential equalization bus must be installed in the 19-inch cabinet and connected to the ground conductor. **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground.
YES ▼		
If you answer “Yes” to both questions, the HiPath 3500 or HiPath 3300 systems may be grounded as described below.		

Procedure: Ground the system

Proceed as follows to ground the HiPath 3500 and HiPath 3300 systems (see also diagram below).

Step	Activity
1.	Connect the grounding cable to the potential equalization bar on the 19-inch cabinet.
2.	Connect the grounding cable to the system's ground connection with the grounding screw supplied (point A).
3.	Attach the grounding cable (strain relief) to the system (point B) with a cable tie.

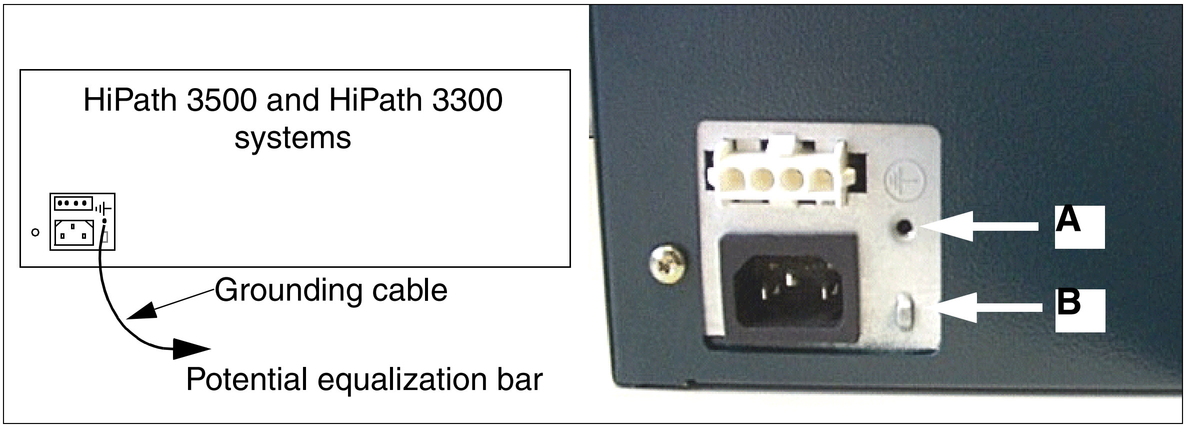

HiPath 3500 and HiPath 3300 systems
Grounding cable
Potential equalization bar
A
B

Figure 4-109 HiPath 3500 and HiPath 3300 - Grounding

⚠ **Danger**
The HiPath 3500 and HiPath 3300 housing to be wall-mounted must be grounded by a separate ground conductor (such as a potential equalization bar). Make sure that the ground conductor is securely installed and strain-relieved.
Failure to follow these instructions can result in electrical shock.

4.4.4.7 Installing the Boards

The systems are already equipped with the boards needed for the customer's specific requirements.

4.4.4.8 Connecting Cables and the Line Network

Not for U.S. and Canada Connection cable for the expansion cabinet rack ECR (if present)

To meet EMC requirements, the braided shields on the connection cable must be connected to the housing on the HiPath 3500 or HiPath 3300 side **and** on the ECR side.

- Attaching to the HiPath 3500 or HiPath 3300 side

  A clip and a tooth lock washer are enclosed with the ECR mounting set. Use these and the housing cover mounting screw to attach the braided shield to the HiPath 3500 or HiPath 3300 housing (as shown in Figure 4-110). The tooth lock washer must be mounted between the painted surface of the cover and the clip.

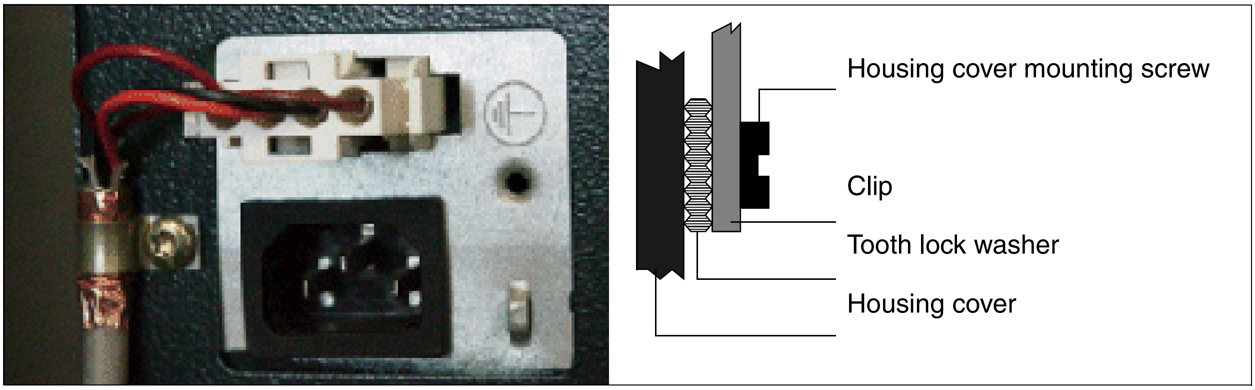


Figure 4-110 HiPath 3500 and HiPath 3300 - Connection Cable to ECR

- Attaching to the ECR side (see Page 9-9)

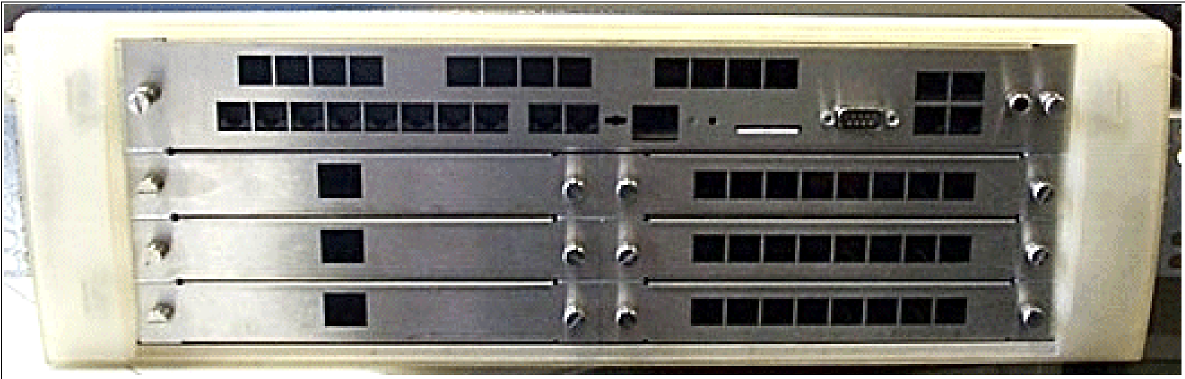
Line network

The connecting cords to the peripherals can be connected directly to the relevant MW8 jacks on the front panel of the 19-inch housing.

4.4.4.9 Configuration notes

HiPath 3500: system overview and slots

> **Caution**
> For safety, operate HiPath 3500 only with the housing front closed. Always use dummy panels (C39165-A7027-B115) to close slots that are not equipped with boards.



		Slot levels:
Slots 1-3		5 (options)
		4 (CBRC)
Slot 6	Slot 7	3 (Peripheralboards)
Slot 8	Slot 9	2 (Peripheralboards)
Slot 4	Slot 5	1 (Peripheralboards)

Figure 4-111 HiPath 3500 - Slot Levels in the 19-Inch Housing

> It is imperative that you observe the restrictions regarding TS2R installation.

HiPath 3300: system overview and slots

Caution
For safety, operate HiPath 3300 only with the housing front closed. Always use dummy panels (C39165-A7027-B115) to close slots that are not equipped with boards.

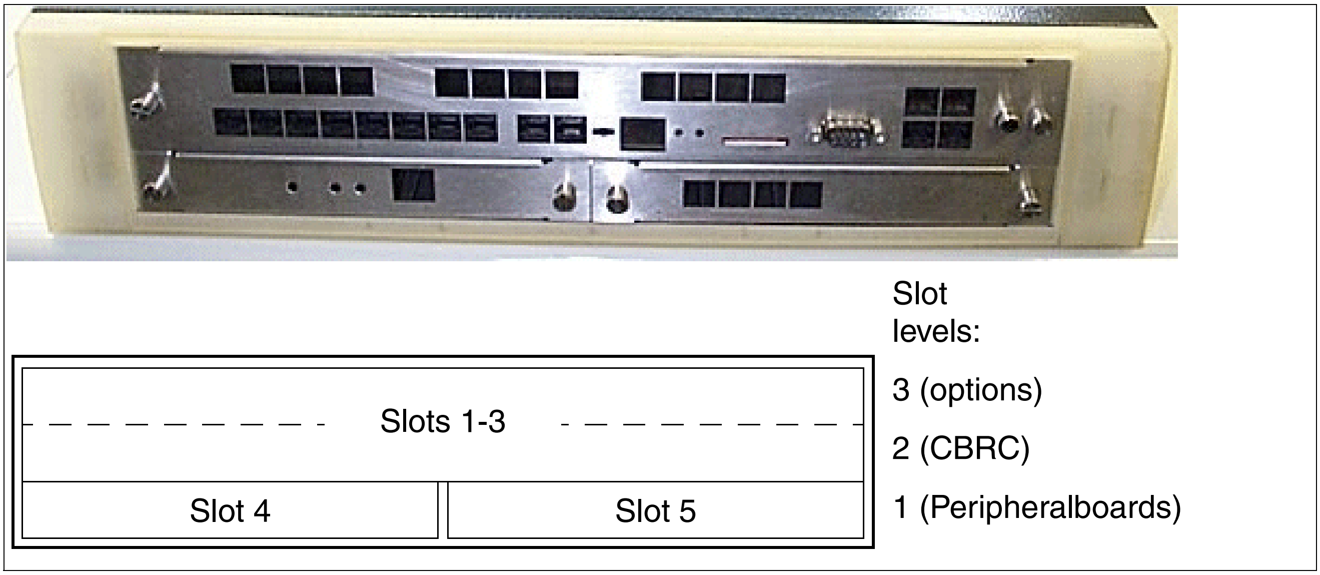

Slots 1-3
Slot 4
Slot 5
Slot levels:
3 (options)
2 (CBRC)
1 (Peripheralboards)

Figure 4-112 HiPath 3300 - Slot Levels in the 19-Inch Housing

Static traffic capacity

The HiPath 3500 and HiPath 3300 systems have the following static traffic capacities.

Table 4-23 HiPath 3500 and HiPath 3300 - Static Traffic Capacity

System	**Slots**	**Static traffic capacity**	**Total static traffic capacity of the system**
HiPath 3500 (see Figure 4-111)	2/3 (CBRC)	24 erlangs	134 erlangs
	4	16 erlangs	
	5	16 erlangs	
	6	16 erlangs	
	7	16 erlangs	
	8	16 erlangs	
	9	30 erlangs[1]	
HiPath 3300 (see Figure 4-112)	2/3 (CBRC)	24 erlangs	56 erlangs
	4	16 erlangs	
	5	16 erlangs	

[1] Use of a TS2R board results in a capacity of 30 erlangs. A maximum of one TS2R per HiPath 3500 is possible, and the board may only be installed in slot 7 or 9, thus resulting in 30 Erlangs for slot 7 or 9.

4.4.4.10 Connecting Workpoint Clients

For information, see Chapter 10.

4.4.4.11 Making trunk connections

Refer to the following board descriptions for information:

- STLS4R (S_0 trunk connection)
- TS2R, only HiPath 3500 (S_{2M} trunk connection)
- TLA4R (Not for U.S.) (MSI)
- TMGL4R (for U.S. only)
- TST1 (for U.S. only), HiPath 3500 only

4.4.4.12 Performing a Visual Inspection

Before starting up the system, you must perform a visual inspection of the hardware, cables, and the power supply. The visual inspection must be performed while the system is disconnected from the power supply.

Caution
Conduct the visual inspection only while the system is disconnected from the power supply.
Always wear an antistatic wristband and observe the measures for protecting electrostatically sensitive devices (see Page 1-9).

Step	Activity	Resources/Remarks	Possible remedies
1.	Compare the slots for the installed boards with the board assignment map.	Board assignment map	Correct the board configuration and notify the sales department.
2.	Check the local line voltage.	Digital multimeter	

After finishing the visual inspection, you can begin starting up the system as described in Chapter 5.

5 Starting Up HiPath 3000

5.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Starting Up HiPath 3800, page 5-2
Starting Up HiPath 3750 and HiPath 3700, page 5-11
Starting Up HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300, page 5-19

5.2 Starting Up HiPath 3800

This section contains information on how to start up the HiPath 3800 communication system.

⚠ **Warning**
Only authorized service personnel should start up the system.

⚠ **Danger**
The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

5.2.1 Startup Procedure

Table 5-1 HiPath 3800 - Startup Procedure

Step	Startup Activity (Remarks)
1.	Supplying the System with Power, page 5-3 (Plugging in the power supply cable for the system cabinet(s) and positioning the switches for all LUNA2 power supplies to “DC-ON” –> starting system boot)
2.	Carrying Out a System Reload, page 5-6
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-7
4.	Not for U.S.: Entering the System Number, page 5-9
5.	Customer-Specific Programming, page 5-10
6.	Performing a System Check, page 5-10

5.2.2 Supplying the System with Power

Procedure

Step	Activity
1.	Plug in the power supply cable for the system cabinet(s).
2.	Position all LUNA2 power supply switches to “DC-ON”. Note: Startup does not begin until the switches on all LUNA2 units are in “DC-ON” position.
3.	Monitor the RUN LED of the CBSAP. The individual steps of the system boot (Table 5-2) can be observed this way.

RUN LEDHiPath 3800

The CBSAP features a RUN LED that signals the system boot status in three phases:

- Phase 1: Basic tasks (recovery, database, query) are started.
- Phase 2: Loadware is installed for peripheral boards.
- Phase 3: Data is installed for peripheral boards.

The RUN LED flashes at a different rhythm to indicate each specific phase. The phases are always separated by a 3-second pause during which the LED is not lit.

Table 5-2 RUN LED - LED Status Meaning

RUN LED			Meaning
1st flashing rhythm	**2nd flashing rhythm**	**3rd flashing rhythm**	
short	short	long	Phase 1: Basic tasks (recovery, database, query) are started.
short	long	short	Phase 2: Loadware is installed for peripheral boards.
short	long	long	Phase 3: Data is installed for peripheral boards.
Definition of the flashing rhythms: ● short = 0.25 s on/0.25 s off ● long = 0.75 s on/0.25 s off			

The HiPath 3800 is ready when the date “1. JAN 00” and the time “00:00” appear in the display on the system telephone.

5.2.2.1 Assigning Station Numbers

The first time the system is initialized, the system determines its capacity and stores the result in the CDB (customer database). After each system reset, the system accesses this data and generates a continuous numbering plan.

If the system detects changes to the board configuration during startup, the following action is taken:

If	Then
Missing or defective board	No action.
Different board type	The system does not automatically activate the board.
Underequipped or same board variant	Board is activated. The same station range is used.
Over-equipped board variant	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available.
New board in empty slot	● Board was the last one installed in accordance with the placement sequence: All boards are activated and the numbering plan continues without a gap. ● Board was inserted ahead of another board in the placement sequence: Board is activated and appended to the last board in the numbering plan.

Procedure: Reinitialization

Proceed as follows if measures to expand the system configuration require reinitialization of the numbering plan:

Step	Activity	Description
1.	Disconnect the system from the power supply. Check that the system is de-energized. Expand as required.	
2.	Connect system to power supply	A continuous numbering plan is generated (as was the case when the system was first initialized). **Notes:** ● Changes to the extension numbers result in changes to the individual, extension-specific data. ● Only those ports provided for in accordance with the maximum configuration are activated if the maximum line configuration is exceeded (too many trunk boards). ● A mixture of subscriber line circuits and trunk lines on one S_0 board can result in gaps in line numbering. This is because all S_0 ports are initially activated as trunks and are only subsequently reconfigured.

5.2.3 Carrying Out a System Reload

After supplying the system with power, you must carry out a system reload.

Procedure

> The reset/reload switch is tested by a Field Programmable Gate Array (FPGA). This FPGA is loaded by the processor when starting up the HiPath 3800 and is only fully functional after the loading process is complete. If the reset/reload switch is activated during loading, then it is not possible to evaluate the cause of the restart. For this reason, the reset/reload switch may only be activated after the system startup (green Run LED lights up).

Press and hold down the reset switch for at least 5 seconds (FAIL LED (red) goes out). If you do not hold down the reset switch for a full 5 seconds, the system may perform a reset rather than a reload or may not reload properly.

5.2.4 Carrying Out the Country Initialization and Selecting the Password Type

> Since the system software no longer provides all languages, some systems no longer start up in the customary local language after the country code is entered. You must now load the local language **prior to country initialization**, using HiPath 3000 Manager E (see information on multilingual text output in the Feature Description HiPath 3000/5000).
> After carrying out the country initialization, but before loading the required local language, the displays come up in German.

Carry out the country initialization on the system telephone with internal station number 100 (port 01). This process loads the country-specific language and features and ensures that the system meets the country's conditions for approval.
In Germany, no country adaptation is required after a reload because the system boots with the German country code by default.

The next step involves selecting the password type.

Input procedure

Table 5-3 Entering the Country Code and Selecting the Password Type

Step	Entry	Description
1.	*95	Start system administration
2.	31994	Default user name
3.	31994	Default password
4.	XXXXX	You are prompted to enter a new password (max. 15 digits)
5.	XXXXX	You are prompted to confirm the password entered in step 4.
6.	29 - 5	Country initialization
7.	X	You are prompted to select the password type: 1 = Variable password 2 = Fixed password
8.	XX	You are prompted to enter the country code (see Page A-24). The system then boots up with the country-specific default information.

Table 5-3 Entering the Country Code and Selecting the Password Type

<table>
<tr><th>Step</th><th>Entry</th><th>Description</th></tr>
<tr><td colspan="3">Notes:
● On step 4 and step 5: If a new password is issued, both steps are omitted when calling the system again.
● On step 6: No country adjustment is necessary for Germany because the system starts up with German codes.
● On step 7: When selecting the fixed password, the default password (31994) overwrites the new password entered under step 4.</td></tr>
</table>

Entering the country code starts the system. Any data that has already been stored, such as system speed-dialing destinations and classes of service, is deleted or reset to the default value.

For Brazil only: CO call privileges, ringback protection per trunk
If the system was initialized with the country code for Brazil, the option for saving the digits dialed and transmitting them via the system (dial rule 1A) is not activated. This can lead to dialing problems at DTMF terminals because the system waits for the dial tone from the analog trunk and does not set up the connection between the DTMF terminal and the trunk until it recognizes the dial tone. Digits dialed before dial tone recognition are therefore not recognized by the CO. This in turn can impact CO call privileges.
To avoid this, Least Cost Routing LCR should be activated for all systems with the country code for Brazil and with connection to analog trunks with DTMF signaling.

After you enter a country code, the default data is only guaranteed to load correctly if the system software has been officially released for that country.

5.2.5 Not for U.S.: Entering the System Number

Introduction

Corresponding to the configuration, the system station number must be entered (without the DID number or attendant code) on the system telephone that is assigned 100 as its internal station number.

The system station number is determined by the network or service provider.

Depending on the configuration type, system station numbers should not be entered for point-to-multipoint operation or for tie trunks to HiPath 4000, for example.

Example

Port number: 98008
National number: 2302 (prefix without 0)
International number: 49 (country code)
Station number type: international

Input procedure

Table 5-4 Entering the System Number

Step	Entry	Description
1.	*95	System administration code
2.	Service	User name (identification)
3.	XXXXX	Enter password
4.	▷ ✓	Watch the display. Scroll until “ISDN parameters” and “PABX number” appear. Confirm your selection. OR: Expert mode: Enter the code 20 2 1 to 4.
5.		Follow the user prompting on the display.

5.2.6 Customer-Specific Programming

You can program the system using one of the following tools:

- Assistant T (programming telephone, see Appendix A)
- HiPath 3000 Manager E (PC tool)

> Changes to the system (for example key programming) made using HiPath 3000 Manager E during an offline programming session will be lost when the database is loaded.
> When you program the system offline, the assignments of trunk and subscriber ports depend on the order in which the boards are inserted. Usually, the boards are inserted from the lowest slot to the highest.

Refer to the HiPath 3000 Manager E Help for information on programming individual features.

5.2.7 Performing a System Check

Checking the telephones

- Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link.
- Perform random terminal tests as described in Section 12.3.1.8 on all telephones.

Checking for proper system booting

- Set up internal and external calls at random to check if the system is functioning properly.

5.3 Starting Up HiPath 3750 and HiPath 3700

This section contains information on how to start up the HiPath 3750 and HiPath 3700 communication systems.

> ⚠ **Warning**
> Only authorized service personnel should start up the system.

5.3.1 Startup Procedure

Table 5-5 HiPath 3750 and HiPath 3700 - Startup Procedure

Step	Startup Activity (Remarks)
1.	Supplying the System with Power, page 5-12 (Plugging in the power supply unit -> starting system boot)
2.	Carrying Out a System Reload, page 5-15
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-15
4.	Not for U.S.: Entering the System Number, page 5-17
5.	Customer-Specific Programming, page 5-18
6.	Performing a System Check, page 5-18

5.3.2 Supplying the System with Power

Procedure

Step	Activity
1.	Plug in the power supply cable on the power supply unit(s).
2.	Monitor the Run LED of the CBCPR. The individual steps of the system boot (Table 5-6) can be observed this way.

HiPath 3750 and HiPath 3700 RUN LED

The CBCPR has a RUN LED that indicates the system status.

Table 5-6 RUN LED - LED Status Meaning

RUN LED	Meaning
Off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data.
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

[1] The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

> The HiPath 3750 or HiPath 3700 is ready when the date “1. JAN 00” and the time “00:00” appear in the display on the system telephone.

5.3.2.1 Assigning Station Numbers

The first time the system is initialized, the system determines its capacity and stores the result in the CDB (customer database). After each system reset, the system accesses this data and generates a continuous numbering plan.

If the system detects changes to the board configuration during startup, the following action is taken:

If	Then
Missing or defective board	No action.
Different board type	The system does not automatically activate the board.
Underequipped or same board variant	Board is activated. The same station range is used.
Over-equipped board variant	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available.
New board in empty slot	● Board was the last one installed in accordance with the placement sequence: All boards are activated and the numbering plan continues without a gap. ● Board was inserted ahead of another board in the placement sequence: Board is activated and appended to the last board in the numbering plan.

Procedure: Reinitialization

Proceed as follows if measures to expand the system configuration require reinitialization of the numbering plan:

Step	Activity	Description
1.	Disconnect the system from the power supply. Check that the system is de-energized. Expand as required.	
2.	Connect system to power supply	A continuous numbering plan is generated (as was the case when the system was first initialized). **Notes:** ● Changes to the extension numbers result in changes to the individual, extension-specific data. ● Only those ports provided for in accordance with the maximum configuration are activated if the maximum line configuration is exceeded (too many trunk boards). ● A mixture of subscriber line circuits and trunk lines on one STMD8 can result in gaps in line numbering. This is because all STMD8 ports are initially activated as trunks and are only subsequently reconfigured.

5.3.3 Carrying Out a System Reload

After supplying the system with power, you must carry out a system reload. This can be performed during the initial system boot.

Procedure

Press and hold down the reset switch for at least 5 seconds (RUN LED goes out). If you do not hold down the reset switch for a full 5 seconds, the system may perform a reset rather than a reload or may not reload properly.

5.3.4 Carrying Out the Country Initialization and Selecting the Password Type

Since the system software no longer provides all languages, some systems no longer start up in the customary local language after the country code is entered. You must now load the local language **prior to country initialization**, using HiPath 3000 Manager E (see information on multilingual text output in the Feature Description HiPath 3000/5000).
After carrying out the country initialization, but before loading the required local language, the displays come up in German.

Carry out the country initialization on the system telephone with internal station number 100 (port 01). This process loads the country-specific language and features and ensures that the system meets the country's conditions for approval.
In Germany, no country adaptation is required after a reload because the system boots with the German country code by default.

The next step involves selecting the password type.

Input procedure

Table 5-7 Entering the Country Code and Selecting the Password Type

Step	Entry	Description
1.	*95	Start system administration
2.	31994	Default user name
3.	31994	Default password
4.	XXXXX	You are prompted to enter a new password (max. 15 digits)
5.	XXXXX	You are prompted to confirm the password entered in step 4.
6.	29 - 5	Country initialization

Table 5-7 Entering the Country Code and Selecting the Password Type

Step	Entry	Description
7.	X	You are prompted to select the password type: 1 = Variable password 2 = Fixed password
8.	XX	You are prompted to enter the country code (see Page A-24). The system then boots up with the country-specific default information.

Notes:

- On step 4 and step 5: If a new password is issued, both steps are omitted when calling the system again.
- On step 6: No country adjustment is necessary for Germany because the system starts up with German codes.
- On step 7: When selecting the fixed password, the default password (31994) overwrites the new password entered under step 4.

Entering the country code starts the system. Any data that has already been stored, such as system speed-dialing destinations and classes of service, is deleted or reset to the default value.

For Brazil only: CO call privileges, ringback protection per trunk
If the system was initialized with the country code for Brazil, the option for saving the digits dialed and transmitting them via the system (dial rule 1A) is not activated. This can lead to dialing problems at DTMF terminals because the system waits for the dial tone from the analog trunk and does not set up the connection between the DTMF terminal and the trunk until it recognizes the dial tone. Digits dialed before dial tone recognition are therefore not recognized by the CO. This in turn can impact CO call privileges.
To avoid this, Least Cost Routing LCR should be activated for all systems with the country code for Brazil and with connection to analog trunks with DTMF signaling.

After you enter a country code, the default data is only guaranteed to load correctly if the system software has been officially released for that country.

5.3.5 Not for U.S.: Entering the System Number

Introduction

Corresponding to the configuration, the system station number must be entered (without the DID number or attendant code) on the system telephone that is assigned 100 as its internal station number.

The system station number is determined by the network or service provider.

Depending on the configuration type, system station numbers should not be entered for point-to-multipoint operation or for tie trunks to HiPath 4000, for example.

Example

Port number: 98008
National number: 2302 (prefix without 0)
International number: 49 (country code)
Station number type: international

Input procedure

Table 5-8 Entering the System Number

Step	Entry	Description
1.	*95	System administration code
2.	Service	User name (identification)
3.	XXXXX	Enter password
4.	▷ ✓	Watch the display. Scroll until “ISDN parameters” and “PABX number” appear. Confirm your selection. OR: Expert mode: Enter the code 20 2 1 to 4.
5.		Follow the user prompting on the display.

5.3.6 Customer-Specific Programming

You can program the system using one of the following tools:

- Assistant T (programming telephone, see Appendix A)
- HiPath 3000 Manager E (PC tool)

> Changes to the system (for example key programming) made using during an HiPath 3000 Manager E offline programming session will be lost when the database is loaded.
> When you program the system offline, the assignments of trunk and subscriber ports depend on the order in which the boards are inserted. Usually, the boards are inserted from the lowest slot to the highest.

Refer to the HiPath 3000 Manager E Help for information on programming individual features.

5.3.7 Performing a System Check

Checking the telephones

- Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link.
- Perform random terminal tests as described in Section 12.3.1.8 on all telephones.

Checking for proper system booting

- Set up internal and external calls at random to check if the system is functioning properly.

5.4 Starting Up HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300

This section contains information on how to start up the HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 communication systems.

⚠ **Warning**
Only authorized service personnel should start up the system.

⚠ **Caution**
For safety, operate HiPath 3500 and HiPath 3300 only with the housing front closed. Always use dummy panels (C39165-A7027-B115) to close slots that are not equipped with boards.

5.4.1 Startup Procedure

Table 5-9 Startup Procedure

Step	Startup Activity (Remarks)
1.	Supplying the System With Power, page 5-20 (starting system boot).
2.	Carrying Out a System Reload, page 5-23
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-23
4.	Not for U.S.: Entering the System Number, page 5-25
5.	Customer-Specific Programming, page 5-26
6.	Performing a System Check, page 5-26

5.4.2 Supplying the System With Power

Procedure

Step	Activity
1.	Plug in the power supply cable and, where applicable, the battery cable.
2.	Monitor the Run LED of the central controller. The individual steps of the system boot (Table 5-10) can be observed this way.

HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300 RUN LED

The central board has a RUN LED that indicates the system status.

Table 5-10 RUN LED - LED Status Meaning

RUN LED	Meaning
Off	No power
on	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data.
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

[1] The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

The system is ready when the date “1. JAN 00” and the time “00:00” appear in the display on the system telephone.

5.4.2.1 Assigning Station Numbers

The first time the system is initialized, the system determines its capacity and stores the result in the CDB (customer database). After each system reset, the system accesses this data and generates a continuous numbering plan.
If the system detects changes to the board configuration during startup, the following action is taken:

If	Then
Missing or defective board	No action.
Different board type	The system does not automatically activate the board.
Underequipped or same board variant	Board is activated. The same station range is used.
Over-equipped board variant	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available.
New board in empty slot	● Board was the last one installed in accordance with the placement sequence: All boards are activated and the numbering plan continues without a gap. ● Board was inserted ahead of another board in the placement sequence: Board is activated and appended to the last board in the numbering plan.

Procedure: Reinitialization

Proceed as follows if measures to expand the system configuration require reinitialization of the numbering plan:

Step	Activity	Description
1.	Disconnect the system from the power supply. Check that the system is de-energized. Expand as required.	
2.	Connect system to power supply	A continuous numbering plan is generated (as was the case when the system was first initialized). **Notes:** ● Changes to the extension numbers result in changes to the individual, extension-specific data. ● Only those ports provided for in accordance with the maximum configuration are activated if the maximum line configuration is exceeded (too many trunk boards). ● A mixture of subscriber line circuits and trunk lines on one S_0 board can result in gaps in line numbering. This is because all board ports are initially activated as trunks and are only subsequently reconfigured. ● S_0 station: If stations are connected to an S_0 board (S_0 bus), their station numbers result from the MSN programmed in the telephone, regardless of the connection. If no MSN is programmed on a telephone or if no MSN can be programmed, the system uses a default MSN. The default MSN can be administered by S_0 port (HiPath 3000 Manager E). ● The system does not assign the MSN until the S_0 port is configured on the “Euro bus”; the MSN can be read out via administration.

5.4.3 Carrying Out a System Reload

After supplying the system with power, you must carry out a system reload. This can be performed during the initial system boot.

Procedure

Press and hold down the reset switch for at least 5 seconds (RUN LED goes out). If you do not hold down the reset switch for a full 5 seconds, the system may perform a reset rather than a reload or may not reload properly.

5.4.4 Carrying Out the Country Initialization and Selecting the Password Type

> Since the system software no longer provides all languages, some systems no longer start up in the customary local language after the country code is entered. You must now load the local language **prior to country initialization**, using HiPath 3000 Manager E (see information on multilingual text output in the Feature Description HiPath 3000/5000).
> After carrying out the country initialization, but before loading the required local language, the displays come up in German.

Carry out the country initialization on the system telephone with the internal station number **100** (HiPath 3550 and HiPath 3500) or **11** for (HiPath 3350 and HiPath 3300) (port 01). This process loads the country-specific language and features and ensures that the system meets the country's conditions for approval.
In Germany, no country adaptation is required after a reload because the system boots with the German country code by default.

The next step involves selecting the password type.

Input procedure

Table 5-11 Entering the Country Code and Selecting the Password Type

Step	Entry	Description
1.	*95	Start system administration
2.	31994	Default user name
3.	31994	Default password
4.	XXXXX	You are prompted to enter a new password (max. 15 digits)
5.	XXXXX	You are prompted to confirm the password entered in step 4.
6.	29 - 5	Country initialization

Table 5-11 Entering the Country Code and Selecting the Password Type

Step	Entry	Description
7.	X	You are prompted to select the password type: 1 = Variable password 2 = Fixed password
8.	XX	You are prompted to enter the country code (see Page A-24). The system then boots up with the country-specific default information.

Notes:
- On step 4 and step 5: If a new password is issued, both steps are omitted when calling the system again.
- On step 6: No country adjustment is necessary for Germany because the system starts up with German codes.
- On step 7: When selecting the fixed password, the default password (31994) overwrites the new password entered under step 4.

Note

Entering the country code starts the system. Any data that has already been stored, such as system speed-dialing destinations and classes of service, is deleted or reset to the default value.

For Brazil only: CO call privileges, ringback protection per trunk
If the system was initialized with the country code for Brazil, the option for saving the digits dialed and transmitting them via the system (dial rule 1A) is not activated. This can lead to dialing problems at DTMF terminals because the system waits for the dial tone from the analog trunk and does not set up the connection between the DTMF terminal and the trunk until it recognizes the dial tone. Digits dialed before dial tone recognition are therefore not recognized by the CO. This in turn can impact CO call privileges.
To avoid this, Least Cost Routing LCR should be activated for all systems with the country code for Brazil and with connection to analog trunks with DTMF signaling.

After you enter a country code, the default data is only guaranteed to load correctly if the system software has been officially released for that country.
Table A-3, HiPath 3550, HiPath 3350 and HiPath 3500 have not been introduced in some of the countries listed in HiPath 3300. The correct loading of the default data is not guaranteed for those countries.

5.4.5 Not for U.S.: Entering the System Number

Introduction

Corresponding to the configuration, the system station number must be entered (without the DID number or attendant code) on the system telephone that is assigned 100 as its internal station number for HiPath 3550 and HiPath 3500 and 11 in the case of HiPath 3350 and HiPath 3300.

The system station number is determined by the network or service provider.

Depending on the configuration type, system station numbers should not be entered for point-to-multipoint operation or for tie trunks to HiPath 4000, for example.

Example

- Port number: 98008
- National number: 2302 (prefix without 0)
- International number: 49 (country code)
- Station number type: international

Input procedure

Table 5-12 Entering the System Number

Step	Entry	Description
1.	*95	System administration code
2.	Service	User name (identification)
3.	XXXXX	Enter password
4.	▷ √	Watch the display. Scroll until “ISDN parameters” and “PABX number” appear. Confirm your selection. OR: Expert mode: Enter the code 20 2 1 to 4.
5.		Follow the user prompting on the display.

5.4.6 Customer-Specific Programming

You can program the system using one of the following tools:

- Assistant T (programming telephone, refer to Appendix A)
- HiPath 3000 Manager E (PC tool)

> Changes to the system (for example key programming) made using during an HiPath 3000 Manager E offline programming session will be lost when the database is loaded.
> When you program the system offline, the assignments of trunk and subscriber ports depend on the order in which the boards are inserted. Usually, the boards are inserted from the lowest slot to the highest.

Refer to the HiPath 3000 Manager E Help for information on programming individual features.

5.4.7 Performing a System Check

Checking the telephones

- Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link.
- Perform random terminal tests as described in Section 12.3.1.8 on all telephones.

Checking for proper system booting

- Set up internal and external calls at random to check if the system is functioning properly.

6 HiPath 5000 Startup and Administration

6.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Introduction, page 6-2
Software Structure, page 6-5
Notes on Open Numbering in a HiPath 3000/5000 Network, page 6-8
Installation Requirements, page 6-9
HiPath 5000, page 6-12
● Preparing for Installation, page 6-12
● Integrating the HiPath 5000 Server in the Customer LAN, page 6-13
● HiPath 5000 Installing Standard Components, page 6-14
● Installing HiPath ComScendo Service, page 6-21
● Installing HiPath Fault Management, page 6-30
● Installing the TAPI Service Provider, page 6-34
● Installing the HiPath Inventory Server Separately, page 6-35
● Verifying Installation, page 6-40
Modifying HiPath 5000 Components (Retro-Fitting, Updating, Deleting), page 6-42
Performing Licensing, page 6-44
Optimizing Operating System Settings, page 6-45
Perform HiPath 5000 Basic Configuration, page 6-47
● Configuring HiPath 5000 with HiPath ComScendo Service, page 6-48
● Configuring HiPath 5000 Server as a Central Administration Unit in an IP Network, page 6-49
HiPath Manager PCM, page 6-53
GetAccount, page 6-54
● Parameters for Call Data Export, page 6-54
Connecting an Uninterruptible Power Supply to HiPath 5000, page 6-59

6.2 Introduction

HiPath 5000 is operated as a central administration unit in an IP network of HiPath 3000 systems. By creating a "Single System Image", all relevant nodes can be centrally administered.

HiPath 5000 is the platform for providing applications at a central point and enables them to be used by all stations in the IP network.

The HiPath ComScendo Service also supports the use of an integrated gatekeeper as well as features for IP workpoint clients from HiPath ComScendo. Up to 1000 registered IP workpoint clients and up to 250 CorNet IP lines (CorNet NQ protocol tunneled in H.323 via Annex M1) are supported in this process.

The HiPath ComScendo Service is virtually a complete HiPath 3000 node that is only configured as software on a PC. Apart from TDM-specific features (e.g. the connection of $U_{P0/E}$ stations, trunks and special stations such as door openers, etc.), all V5.0 features are available. The HiPath ComScendo Service is administered over HiPath 3000 Manager E, while the HG 1500 resources (see Page 10-38) are administered over Web-based Management (WBM).

Cross-platform use of HiPath ComScendo features (IP networking), for example in conjunction with HiPath 4000, is implemented via CorNet-IP (CorNet-NQ protocol tunnelled in H.323 via annex M1). HG 1500 in HiPath 3000 and HG3550 V2.0 in HiPath 4000 are prerequisites for IP networking over CorNet IP.

Parts of the following setup for HiPath 5000 are optional and can be installed both on the HiPath 5000 Server and on a separate PC.

- Feature Server (central administration service in a HiPath 3000/5000 network)
- Presence Manager (service for LED signaling of call processing station statuses and network-wide DSS keys)
- HiPath ComScendo Service (gatekeeper and HiPath ComScendo features for IP workpoint clients)
- HiPath 3000 Manager E (MS Windows-based tool for the administration of all service and customer-specific data by Service)
- HiPath 3000 Manager C (MS Windows-based tool for the administration of customer-specific data by the customer)
- HiPath Software Manager (Web-based tool for upgrades (Upgrade Manager for HiPath ComScendo Service and HG 1500) and backups (Backup Manager for HiPath ComScendo Service, HG 1500 and databases))
- Inventory Manager (service for detecting software components installed and system information in a HiPath 3000/5000 network)
- Customer License Agent CLA (service for analyzing and decrypting a HiPath License Management license file)

- Central License Manager CLM (CLA front-end for reading in licenses in online and offline mode)
- Personal Call Manager PCM (Web-based application for the configuration and administration of personal call forwarding operations)
- HiPath FM Desktop V3.0 (Java-based application for error signaling)
- GetAccount (application that prepares generated call data records for further processing.)

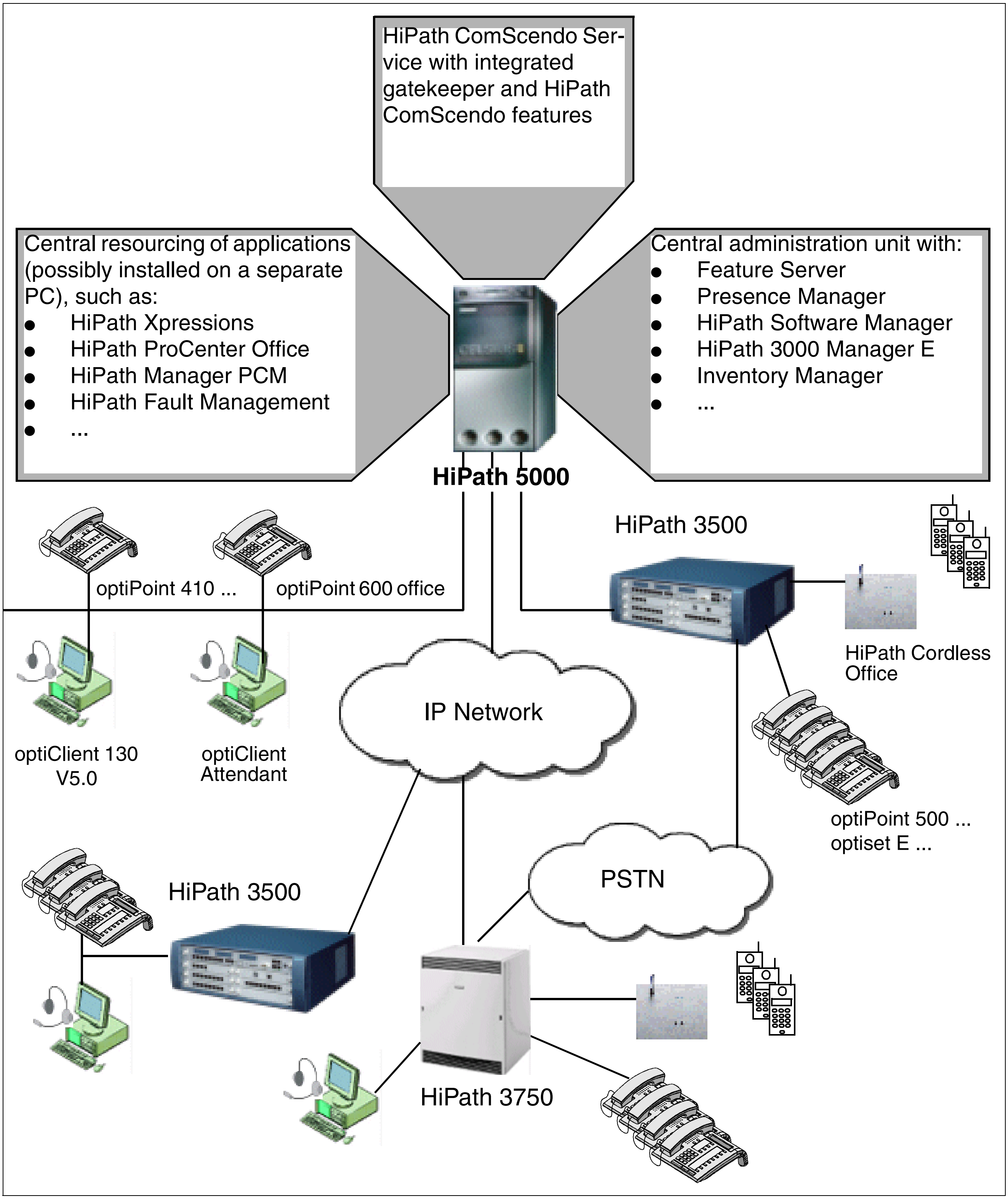

HiPath ComScendo Service with integrated gatekeeper and HiPath ComScendo features
Central resourcing of applications (possibly installed on a separate PC), such as:
● HiPath Xpressions
● HiPath ProCenter Office
● HiPath Manager PCM
● HiPath Fault Management
● ...
Central administration unit with:
● Feature Server
● Presence Manager
● HiPath Software Manager
● HiPath 3000 Manager E
● Inventory Manager
● ...
HiPath 5000
HiPath 3500
optiPoint 410 ...
optiPoint 600 office
HiPath Cordless Office
optiClient 130 V5.0
optiClient Attendant
IP Network
optiPoint 500 ...
optiset E ...
PSTN
HiPath 3500
HiPath 3750

Figure 6-1 HiPath 5000 Multi-Node IP System

6.3 Software Structure

Feature Server

The Feature Server is an essential component in the HiPath 5000 software architecture and serves as a central point for administration and as a data interface for applications and middleware. In addition, the Feature Server synchronizes the HG 1500 boards with all necessary data for digit analysis in a HiPath 3000/5000 network.

The networked HiPath 3000 systems (nodes) are administered over the Feature Server. The HiPath 3000 Manager E administration tool does not communicate with the individual systems but exchanges data with the Feature Server. The Feature Server ensures that the networked HiPath 3000 systems receive synchronized CDB data.

The individual systems are accessed directly by HiPath 3000 Manager E in the course of maintenance and online functions.

HG 1500 boards are still administered on a board-specific basis using Web-based management (WBM).

The Feature Server is an MS Windows service that automatically starts at the same time as the HiPath 5000 server.

Communication with the individual HiPath 3000 systems belonging to the network takes place over their HG 1500 boards.

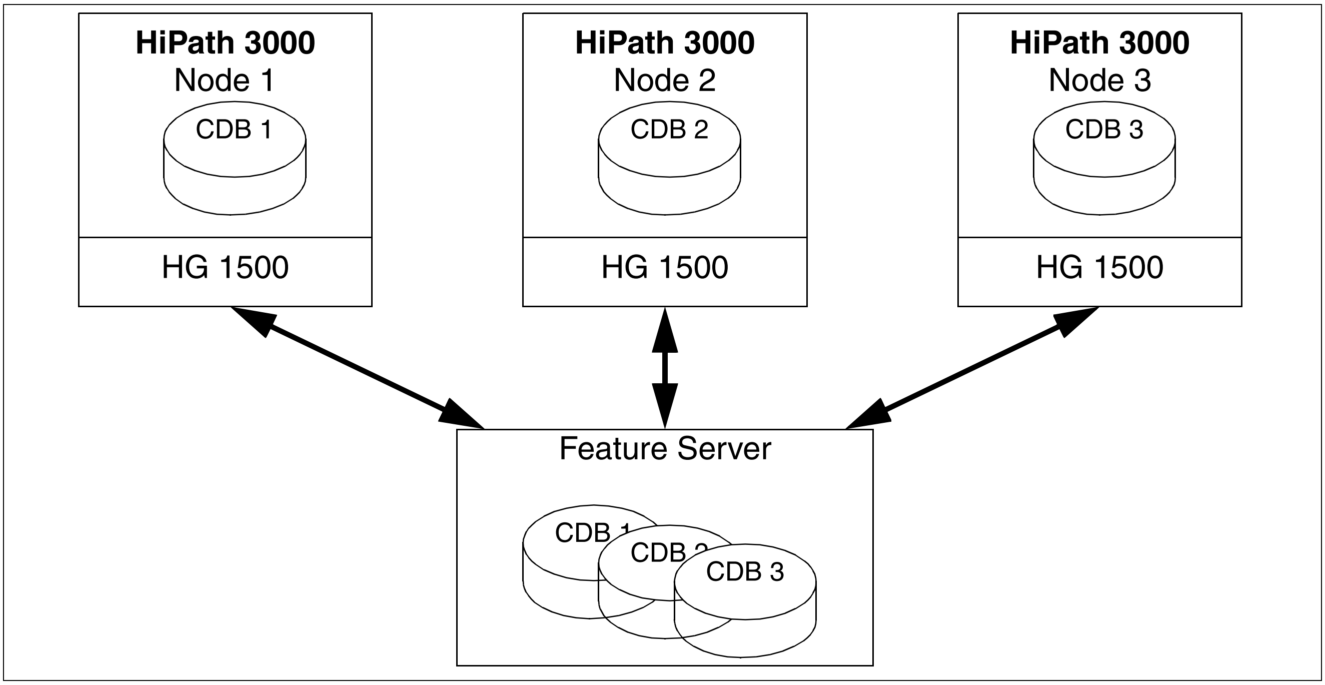


Figure 6-2 Customer Data Exchange Between the Feature Server and Nodes

The following figure shows the services and routines associated with the Feature Server.

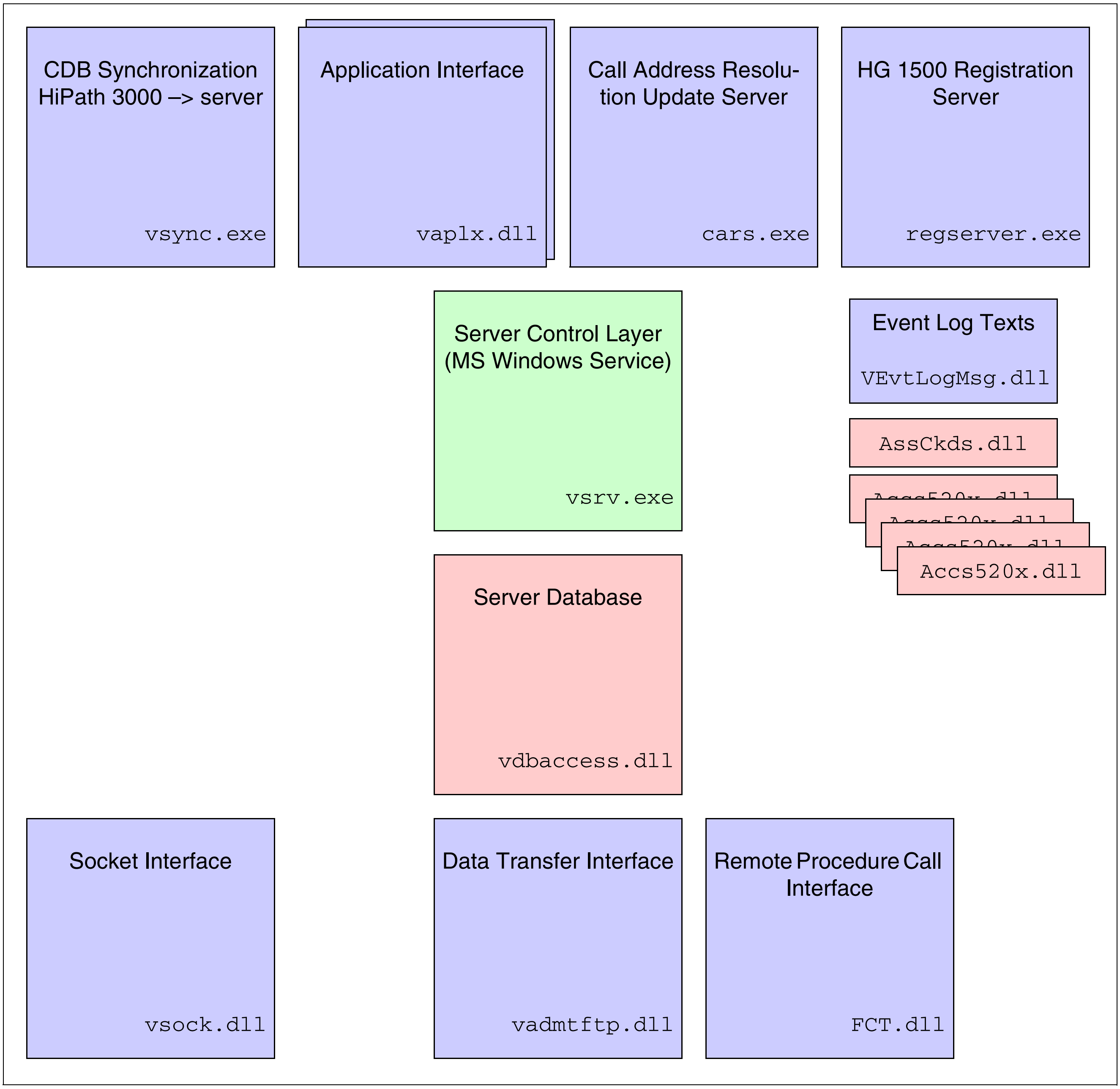

CDB Synchronization HiPath 3000 –> server
vsync.exe
Application Interface
vaplx.dll
Call Address Resolution Update Server
cars.exe
HG 1500 Registration Server
regserver.exe
Server Control Layer (MS Windows Service)
vsrv.exe
Event Log Texts
VEvtLogMsg.dll
AssCkds.dll
Accs520x.dll
Server Database
vdbaccess.dll
Socket Interface
vsock.dll
Data Transfer Interface
vadmtftp.dll
Remote Procedure Call Interface
FCT.dll

Figure 6-3 Feature Server Services and Routines

The following table shows the **most important** features of the Feature Server.

Table 6-1 Feature Server Components

Component	Function
`vsrv.exe`	Basic Feature Server component. As an MS Windows service, it starts all other components.
`vaplx.dll`	Logical interface for applications. Provides read-only and read/write access to CDB data.
`cars.exe`	The Call Address Resolution Server provides the HG 1500 boards with the call numbers of all HiPath 3000 systems (nodes) that belong to the network. Note: Event 1027 confirms that the corresponding HG 1500 board was successfully downloaded with the call numbers of all HiPath 3000 systems associated with the network (see Section 12.3.3).
`regserver.exe`	Following startup, the HG 1500 boards automatically log on to the Feature Server over the Registration Server.
`vsync.exe`	All “node-specific” CDB changes (for example, by key programming, Assistant T) are reported by the node to the Feature Server’s VSYNC process. This ensures the automatic synchronization of the Feature Server with the new CDB data.
`FCT.dll`	Interface to the systems for direct CDB data access.

Presence Manager

This is a Feature Server service for signaling the call processing station states “free”, “busy” and “call” using the LEDs on the optiset E and optiPoint telephones in a HiPath 3000/5000 network. You can pick up a call by pressing the appropriate button.

Call processing states can only be signaled for a station if the Presence Manager can set a CSTA monitor point on the relevant station. The status of a MULAP call number cannot be signaled, for example, because a CSTA monitor point cannot be set on a call number of this type.

The dssserver.exe service for the Presence Manager is installed with the HiPath 5000 software. This is a user-configured service that receives its information from `vaplx.dll`. The TAPI Service Provider is required for the Presence Manager to work.

Note for troubleshooting and diagnosis
The Feature Server and Presence Manager components generate entries in the Event Viewer (event log) which are used for troubleshooting and diagnosis. Section 12.3.3 provides information on the possible entries and any necessary user responses.

6.4 Notes on Open Numbering in a HiPath 3000/5000 Network

In contrast to standalone systems, a HiPath 3000/5000 network performs call number evaluation in a number of stages. All station and group numbers for the relevant HiPath 3000 systems (nodes) are kept on the HG 1500 boards and subject to digit analysis. The Feature Server sends the IP addresses of the relevant HiPath 3000 systems to the HG 1500 boards. The Feature Server also assigns every HG 1500 board a call number table in which all call numbers of the other HiPath 3000 systems are saved. This means that every call number dialed can be uniquely assigned to a node. These call number tables are also known as CAR (Call Address Resolution) tables. The call number tables can be displayed using HG 1500's Web-based management (WBM). Changes made to tables with the WBM can impact the digit analysis functionality and are not permitted. The CAR tables are updated and overwritten by the Feature Server after every administration activity.

Internal call numbers can be assigned more than once in a network using open numbering. However, to enable unique call number evaluation, every HiPath 3000 system is assigned a unique node number. A station in node A always dials a station in node B by entering the node number + internal call number.

The "Open numbering" system flag in HiPath 3000 Manager E must be set for every HiPath 3000 system involved. This flag must be set to permit the administration of the node number.

> The node number (Settings/System parameters.../Flags: Node number) and the incoming PABX number for route 16 (HG 1500 route) (Settings/Lines / networking.../ Routes: PABX number - incoming) should be identical for every HiPath 3000 system.

6.5 Installation Requirements

To use HiPath 5000, the following minimum requirements must be met:

- Hardware and software

Table 6-2 HW and SW Minimum Requirements for HiPath 5000

Component	**New system**	**Upgrade an existing system to V5.0**
Processor	3 GHz CPU	Pentium III 1 GHz
RAM space	See Table 6-3	See Table 6-3
Hard disk	80 GB	18 GB
Operating system	MS Windows Server 2000 or MS Windows Server 2003	MS Windows Server 2000
Interfaces	2 x serial	2 x serial
Slots	free PCI slots (for S_0/S_{2M} boards for HPCO and HiPath Xpressions)	free PCI slots (for S_0/S_{2M} boards for HPCO and HiPath Xpressions)
Drives	3.5-inch floppy disk drive CD-ROM/DVD drive	3.5-inch floppy disk drive CD-ROM/DVD drive
Network card	10/100/1000 Mbps Ethernet network card	10/100 Mbps Ethernet network card
Monitor	17-inch color monitor	17-inch color monitor

- Licenses

  Information on features, interfaces, and products subject to mandatory licensing can be found in **Chapter 8, “Licensing”**.

- RAM requirements of the HiPath 5000 server

  Table 6-3 can be used to determine the required RAM expansion (RAM space) of the HiPath 5000 server depending on the number of nodes in the HiPath 3000/5000 network and the applications installed on the server.

Table 6-3 RAM Space of the HiPath 5000 Server

	Minimum RAM				
	Up to 2 nodes	**Up to 8 nodes**	**Up to 16 nodes**	**Up to 32 nodes**	**Up to 64 nodes**[1]
HiPath 5000 V5.0 + HiPath FM V3.0 + Teledata Office V3.0 + HiPath Software Manager	512 MB	1 GB	1 GB	1.5 GB	2 GB
HiPath ComScendo Service	+ 100 MB	+ 100 MB	+ 100 MB	+ 100 MB	not supported
HiPath Manager PCM V2.0	+ 90 MB	+ 90 MB	+ 90 MB	+ 90 MB	+ 90 MB
HiPath ProCenter Office V1.3 with HiPath Xpressions V3.0[2]	+ 400 MB	+ 400 MB	+ 600 MB	not supported	not supported
DLS	+ 250 MB	+ 250 MB	+ 250 MB	+ 250 MB	+ 250 MB

[1] Networks are currently released with up to 32 nodes. Larger configurations can be released on a project-specific basis.

[2] In this special configuration, HiPath Xpressions V3.0 supports up to 248 Unified Messaging users or 400 voice mail users.

6.5.1 Prerequisites for a Single-PC Solution

Table 6-4 shows the maximum expansion level permitted for the HiPath ComScendo Service together with HiPath 5000 (central administration unit in an IP network) and other applications on a single PC.

Table 6-4 Prerequisites for a Single-PC Solution

	Upgrade V4.0 to V5.0 1-node system (1 GHz CPU)	**2 nodes**[1] **(3 GHz CPU)**	**3 - 6 nodes**[1] **(3 GHz CPU)**	**7 - 16 nodes**[1] **(3 GHz CPU)**	**17 - 32 nodes**[1] **(3 GHz CPU)**	**33 - 64**[2] **nodes**[1] **(3 GHz CPU)**
HiPath ComScendo Service[3]	not possible	possible	possible	not possible	not possible	not possible
HiPath 5000 (central administration unit in an IP network)	possible	possible	possible	possible	possible	possible

Table 6-4 Prerequisites for a Single-PC Solution

	Upgrade V4.0 to V5.0 1-node system (1 GHz CPU)	**2 nodes[1] (3 GHz CPU)**	**3 - 6 nodes[1] (3 GHz CPU)**	**7 - 16 nodes[1] (3 GHz CPU)**	**17 - 32 nodes[1] (3 GHz CPU)**	**33 - 64[2] nodes[1] (3 GHz CPU)**
HiPath Software Manager	possible	possible	possible	possible	possible	possible
DLS[3]	possible	possible	possible	possible	possible	possible
HiPath Manager PCM V2.0	possible	possible	possible	possible	possible	possible
HiPath FM	possible	possible	possible	possible	possible	possible
Teledata Office[3]	possible	possible	possible	possible	possible	possible
HPCO including HiPath Xpressions[3]	up to 248 stations possible	up to 248 stations possible	up to 248 stations possible	up to 248 stations possible	not possible	not possible
HPCO[3]	1 to 32 agents possible	1 to 32 agents possible	1 to 32 agents possible	1 to 32 agents possible	not possible	not possible

[1] Every HiPath 3000 gateway, every survivable media gateway and every HiPath ComScendo service counts as a node.

[2] Networks are currently released with up to 32 nodes. Larger configurations can be released on a project-specific basis.

[3] We do not recommend installing DLS, Teledata Office, HPCO (including HiPath Xpressions), and HiPath ComScendo Service together on a PC. Real-time operation of the HiPath ComScendo Service cannot be guaranteed if the lion's share of processor resources is required for DLS, Teledata Office, HPCO (including HiPath Xpressions). Software updates, call charge data queries, statistics, etc. must be performed during off-peak hours when few or no calls are underway.
If the customer is unwilling to accept restrictions, HiPath ComScendo Service must be installed on a separate PC.

6.6 HiPath 5000

6.6.1 Preparing for Installation

To ensure successful installation, you should check the points listed in the table below **before** installing the HiPath 5000 software.

Table 6-5 HiPath 5000 - Preparing for Installation

Component	Description
Hard disk partitioning	The server PC hard disk should be divided into **two** NTFS partitions. The **main partition C** should have a capacity of at least 4 GB and should be reserved for the operating system and the HiPath 5000 software. For safety reasons, partitioning with the format FAT 16/32 is **not permitted**.
Hardware	Make sure that no unnecessary hardware is connected to the server PC; any sound cards should be removed.
Access privileges	To install HiPath 5000, you must log on to the operating system with administrator rights or, if necessary, log on as the server domain administrator.
LAN integration	Check to ensure that the server PC has been correctly integrated in the customer LAN (see Section 6.6.2).
Miscellaneous	All applications running in the background must be closed prior to software installation.

6.6.2 Integrating the HiPath 5000 Server in the Customer LAN

> Network analysis must be performed before the relevant systems and applications are installed to guarantee smooth operation in the IP customer network. Network analysis determines the conditions under which the IP customer's network is suitable for a HiPath 3000/5000 network.
> The data necessary for integrating the HiPath 5000 server, for example, IP addresses, is defined as part of network analysis and in consultation with the customer (requirements specifications).

The settings are made under `Control Panel - Network - Protocols`.

- Modify the IP address
- Adapt the subnet mask, gateway.
- Adapt the DNS entries, WINS entries.
- Once the data has been customized, a reboot is required.
- Test the LAN connection with a "ping" to another computer
- Integrate the HiPath 5000 in the Windows domain under Control Panel - Network - Identification (a domain administrator account is required here!)

6.6.3 HiPath 5000 Installing Standard Components

6.6.3.1 Overview

The installation program (Master Setup) enables both the basic installation of a HiPath 5000 system including middleware and components for system administration/analysis and the post-installation of individual software components and tools (update, see Section 6.7).

Table 6-6 Software Components and Master Setup Tools

Component	Server PC	Client PC	Standard component (default setup)[1]
HiPath ComScendo service	Yes	Yes	No (see Section 6.6.4)
MSDE 2000 SQL database with SP3	Yes	No	Yes
TFTP Server	Yes	Yes	Yes
Common Web Service	Yes	Yes	Yes
HiPath Call Accounting (GetAccount)	yes, optional	No	No (see Section 6.12)
HiPath Manager PCM	yes, optional	network-based release	No (see Section 6.11)
HiPath 3000 Manager E	Yes	Yes	Yes
HiPath 3000 Manager C	yes, optional	No	No
HiPath Inventory	Yes	Yes	Yes (see Section 6.6.7)
HiPath Software Manager	Yes	No	Yes
Feature Server, Presence Manager	Yes	No	Yes
HiPath Fault Management			No (see Section 6.6.5)
Customer License Agent CLA	Yes	yes (MS Windows 2000 Pro. or later)	Yes
Customer License Manager CLM	yes, optional	No	No

[1] Standard components should generally always be installed and are therefore already selected in the master setup (= default setup).

> HiPath ComScendo Service cannot be operated at the same time as an optiClient 130 V5.0 on a single PC.

6.6.3.2 Licensing

Please refer to **Chapter 8, “Licensing”** for information on how to proceed.

A grace period of 30 days begins after startup. Licensing must be performed for all features, interfaces, and products subject to mandatory licensing within this grace period.

HiPath 3000 Manager E comes with a customer-specific file which is used by the Customer License Agent CLA to generate a GPCF (Grace Period Configuration File) file. This file ensures that the maximum expansion of all features subject to mandatory licensing is possible within the 30-day grace period. The system or systems are not licensed.

The system falls into licensing default if licensing is not performed within the 30-day grace period. This means that features which subject to mandatory licensing will suffer from reduced functionality.

6.6.3.3 Starting the Installation

A TAPI service provider must be installed on the relevant PC to enable the default setup to be performed. Installation information can be found in Section 6.6.6.

Procedure

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser. German (Germany) and English (USA) versions are currently available.

   The system is prepared for installation.

3. Click **Next** to start the installation routine.

   Important installation information is displayed.

   This includes the latest information on installation. Please read this information carefully.

4. Click **Next** to proceed with the installation routine.

5. **Select destination path**.

   Select the folder where you want to install the program.

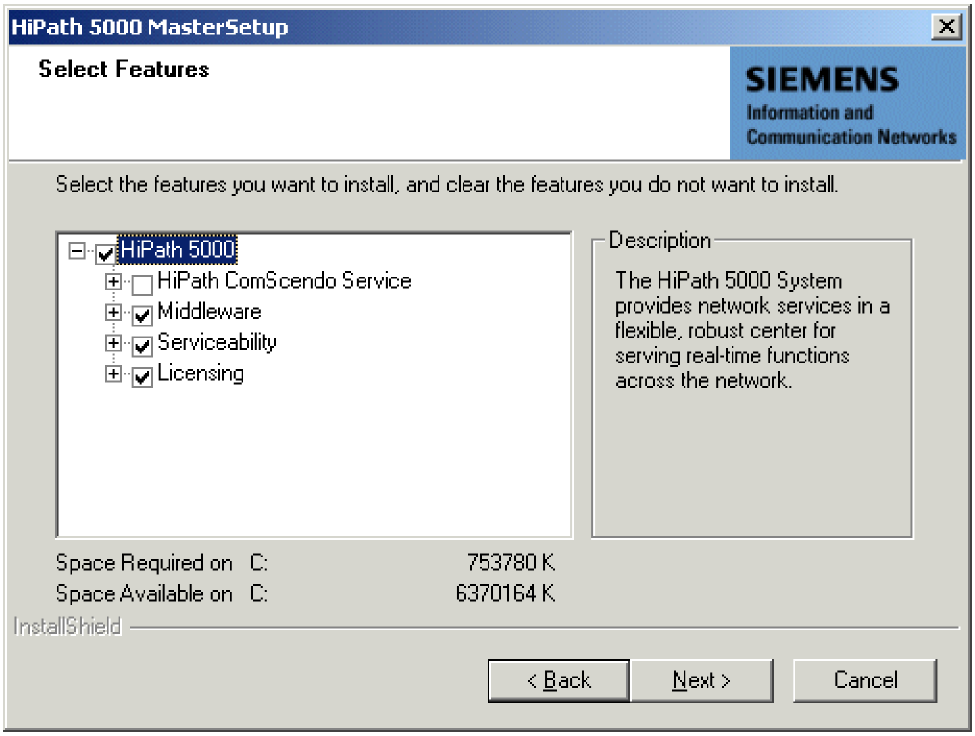
   Confirm the default folder `c:\program files\siemens\hipath\` with **Next** or click **Browse** and select a different folder.

6. **Select program folder**.

   Select the location where the setup should create the new shortcuts.

   Confirm the default folder `HiPath` with **Next** or select a different folder.

7. The **Select Features** dialog appears.


HiPath 5000 MasterSetup
Select Features
SIEMENS
Information and Communication Networks

Select the features you want to install, and clear the features you do not want to install.

- ☑ HiPath 5000
  - ☐ HiPath ComScendo Service
  - ☑ Middleware
  - ☑ Serviceability
  - ☑ Licensing

Description

The HiPath 5000 System provides network services in a flexible, robust center for serving real-time functions across the network.

Space Required on C: 753780 K
Space Available on C: 6370164 K

InstallShield
< Back
Next >
Cancel

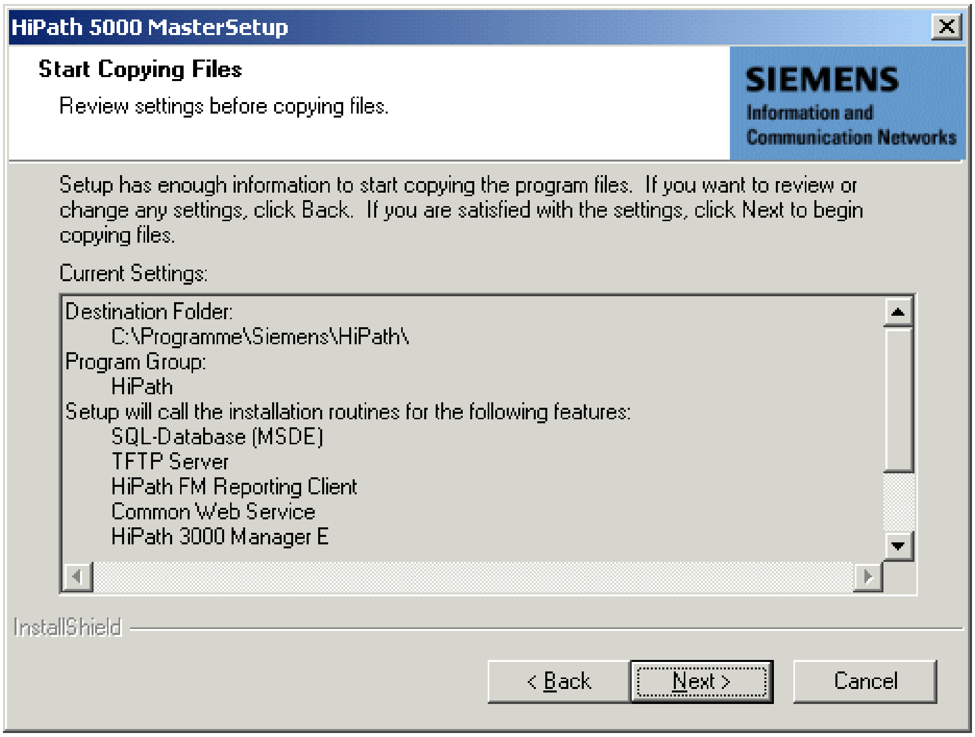
Mark the components you want to install and unmark the ones you don’t.

> The components marked by default (Default Setup) are standard components that as a rule should always be installed. For information on the exact components to install, refer to your order.
> The subsequent description of the installation procedure relates to the default setup.
> Information on installing the HiPath ComScendo Service can be found in Section 6.6.4.

8. Then click **Next**.

> At this point your attention is drawn to the fact that a TAPI service provider must be installed for the current selection of components.
> If this requirement is met, click Yes to continue with the procedure.
> If there is no TAPI service provider installed, click No to cancel the procedure.
> Install the TAPI service provider on the basis of the information in Section 6.6.6.
> Then restart the master setup.

The **Start Copying Files** dialog appears.



HiPath 5000 MasterSetup

Start Copying Files

Review settings before copying files.

Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.

Current Settings:

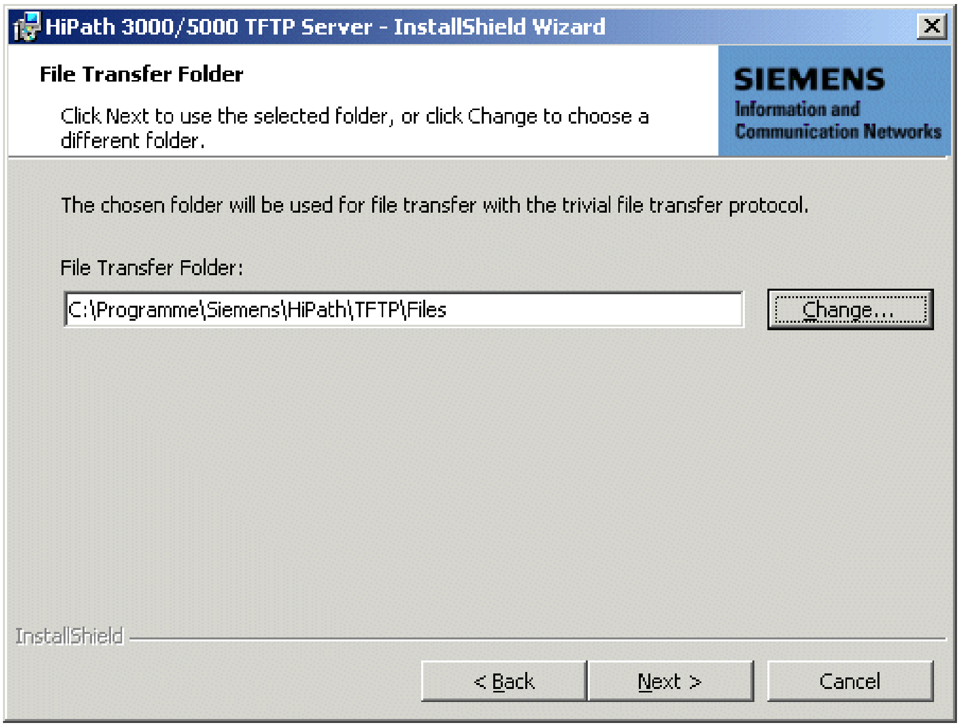
```
Destination Folder:
      C:\Programme\Siemens\HiPath\
Program Group:
      HiPath
Setup will call the installation routines for the following features:
      SQL-Database (MSDE)
      TFTP Server
      HiPath FM Reporting Client
      Common Web Service
      HiPath 3000 Manager E
```

Check if the correct destination directory and program group are specified and if all necessary components are installed.

9. Click **Next** to start the copy operation.

> The PC reboots after installing the MSDE 2000 SQL database.
> The installation procedure is automatically continued after rebooting.

10. The **File Transfer Folder** appears.



HiPath 3000/5000 TFTP Server - InstallShield Wizard

File Transfer Folder

Click Next to use the selected folder, or click Change to choose a different folder.

The chosen folder will be used for file transfer with the trivial file transfer protocol.

File Transfer Folder: C:\Programme\Siemens\HiPath\TFTP\Files

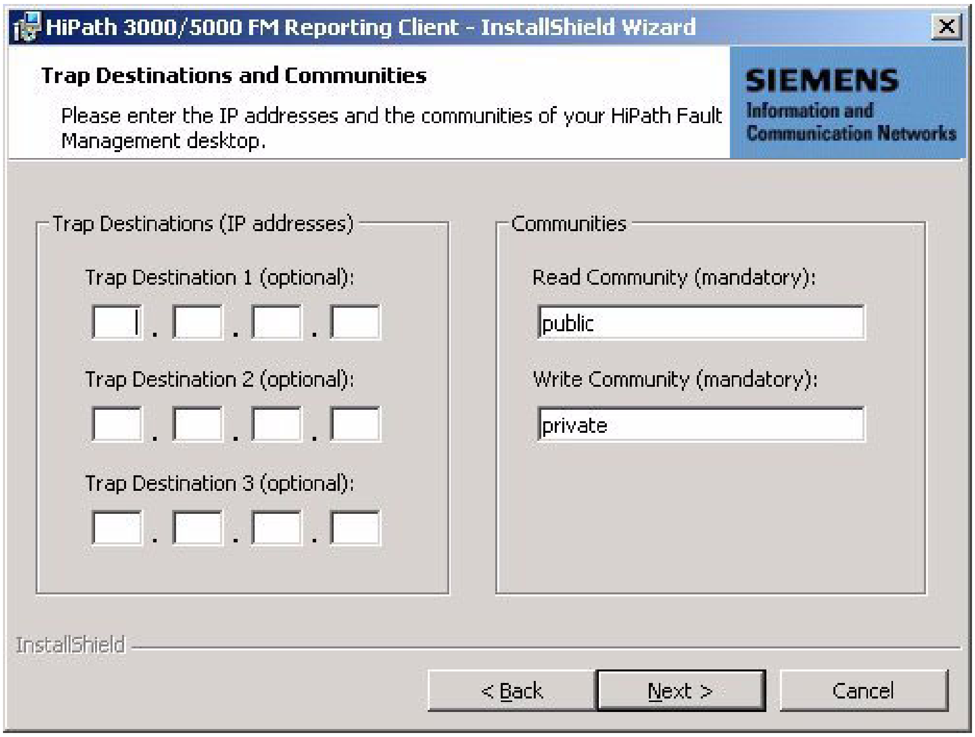
SIEMENS
Information and
Communication Networks
Change...
InstallShield
< Back
Next >
Cancel

Select the folder where you want to install the files.

Confirm the default folder `c:\program files\siemens\hipath\tftp\files\` with **Next** or click **Change** to select a different folder.

11. Click **Next** to proceed with the setup routine.

    The **Trap Destinations and Communities** dialog appears.



HiPath 3000/5000 FM Reporting Client - InstallShield Wizard
SIEMENS
Information and Communication Networks
InstallShield
< Back
Next >
Cancel

Trap Destinations and Communities

Please enter the IP addresses and the communities of your HiPath Fault Management desktop.

Trap Destinations (IP addresses)

Trap Destination 1 (optional): . . .

Trap Destination 2 (optional): . . .

Trap Destination 3 (optional): . . .

Communities

Read Community (mandatory): public

Write Community (mandatory): private

Enter the trap destinations (if necessary) and the HiPath Fault Management desktop community names.

12. Click **Next** to proceed with the setup routine.
13. When all selected components are installed, a dialog appears in which you can terminate the setup with **Finish**.

6.6.4 Installing HiPath ComScendo Service

The HiPath ComScendo Service is virtually a complete HiPath 3000 node that is only configured as software on a PC. Apart from TDM-specific features (e.g. the connection of $U_{P0/E}$ stations, trunks and special stations such as door openers, etc.), all V5.0 features are available. The HiPath ComScendo Service is administered over HiPath 3000 Manager E, while the HG 1500 resources (see Page 10-38) are administered over Web-based Management (WBM).

The HiPath ComScendo service is not a standard component (default setup) of the master setup. For this reason, the procedure for a separate installation will be described here.

Procedure

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser. German (Germany) and English (USA) versions are currently available.

   The system is prepared for installation.

3. Click **Next** to start the installation routine.

   Important installation information is displayed.

   This includes the latest information on installation. Please read this information carefully.

4. Click **Next** to proceed with the installation routine.

5. **Select destination path**.

   Select the folder where you want to install the program.

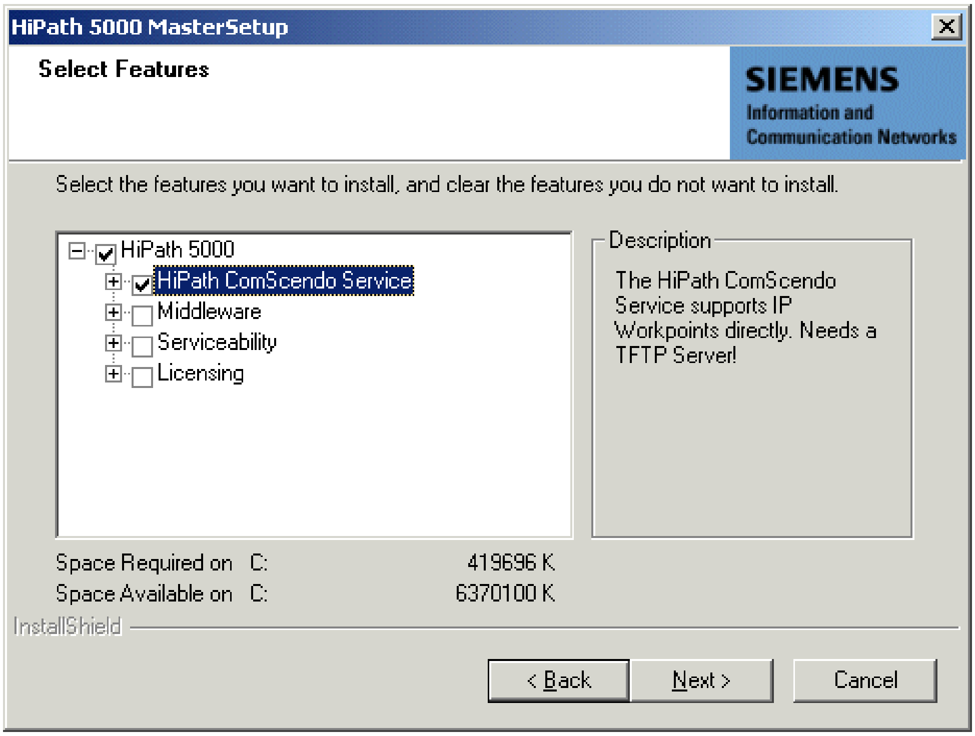
   Confirm the default folder `c:\program files\siemens\hipath\` with **Next** or click **Browse** and select a different folder.

6. **Select program folder**.

   Select the location where the setup should create the new shortcuts.

   Confirm the default folder `HiPath` with **Next** or select a different folder.

7. The **Select Features** dialog appears.


HiPath 5000 MasterSetup
SIEMENS
Information and Communication Networks
InstallShield
< Back
Next >
Cancel

Select Features

Select the features you want to install, and clear the features you do not want to install.

- ☑ HiPath 5000
  - ☑ HiPath ComScendo Service
  - ☐ Middleware
  - ☐ Serviceability
  - ☐ Licensing

Description

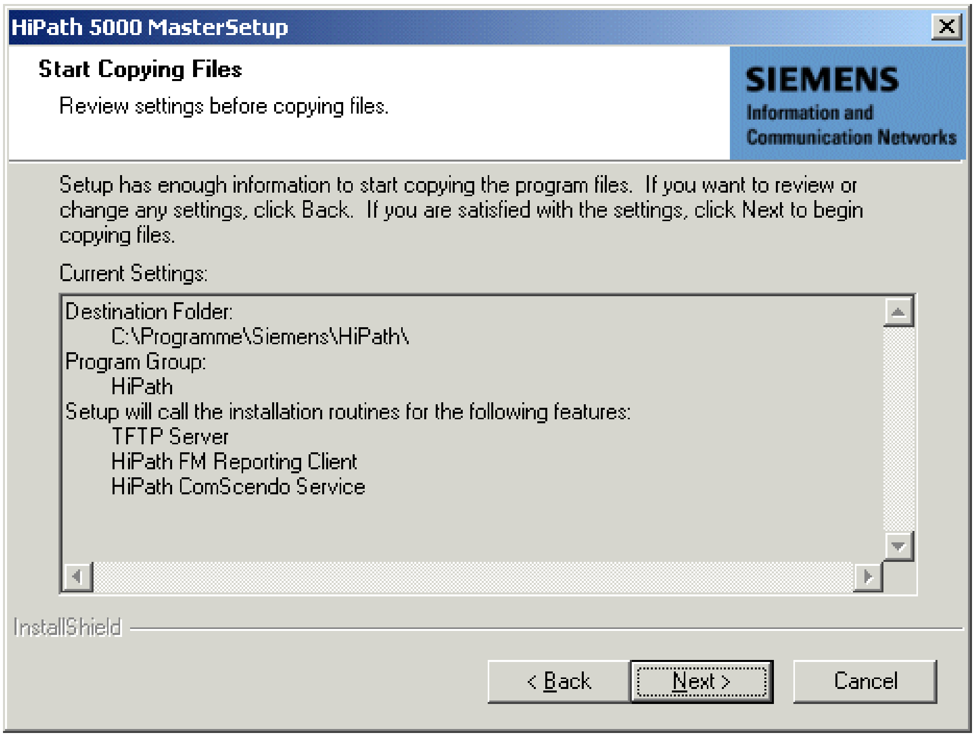
The HiPath ComScendo Service supports IP Workpoints directly. Needs a TFTP Server!

Space Required on C: 419696 K
Space Available on C: 6370100 K

Select the HiPath ComScendo Service components you want to install and deselect the ones you do not want to install.

8. Then click **Next**.

   The **Start Copying Files** dialog appears.



HiPath 5000 MasterSetup
SIEMENS
Information and Communication Networks
InstallShield
< Back
Next >
Cancel

Start Copying Files

Review settings before copying files.

Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.

Current Settings:

Destination Folder:
C:\Programme\Siemens\HiPath\
Program Group:
HiPath
Setup will call the installation routines for the following features:
TFTP Server
HiPath FM Reporting Client
HiPath ComScendo Service

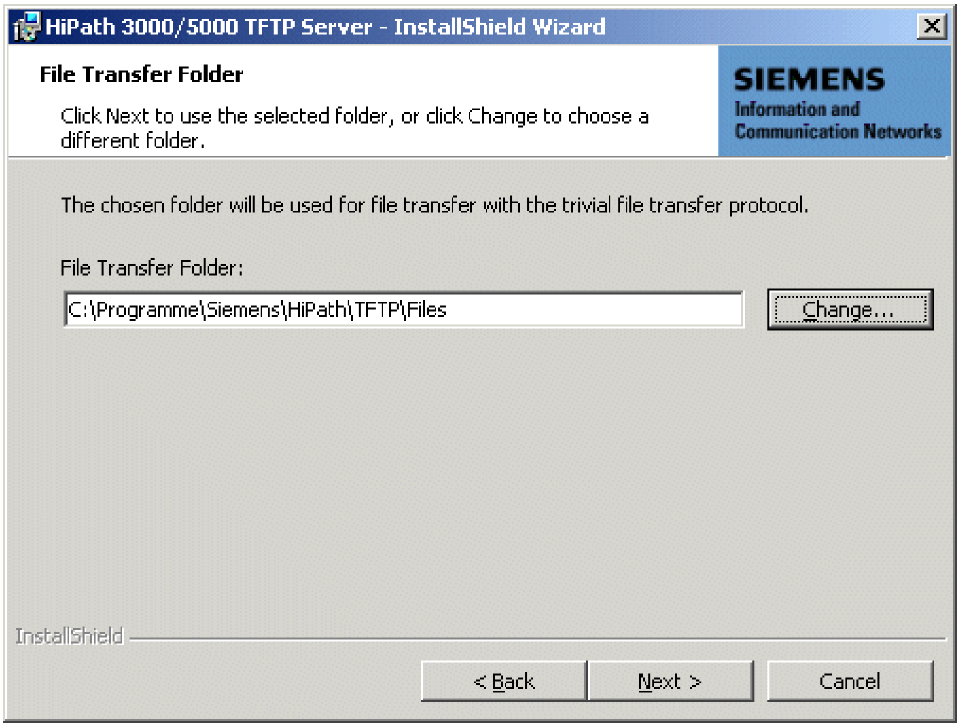
Finally, check whether the correct target directory and program group have been specified.

To implement the setup for the HiPath ComScendo service, both a TFTP server and an FM Reporting client must be installed on the relevant PC. Both components are automatically selected and installed by the Master Setup.

9. Click **Next** to start the copy procedure.

   The **File Transfer Folder** appears.

   Note: This dialog only appears if none of the Master Setup components has been installed on the PC.



HiPath 3000/5000 TFTP Server - InstallShield Wizard

File Transfer Folder

Click Next to use the selected folder, or click Change to choose a different folder.

The chosen folder will be used for file transfer with the trivial file transfer protocol.

File Transfer Folder:

C:\Programme\Siemens\HiPath\TFTP\Files

SIEMENS
Information and Communication Networks
Change...
InstallShield
< Back
Next >
Cancel

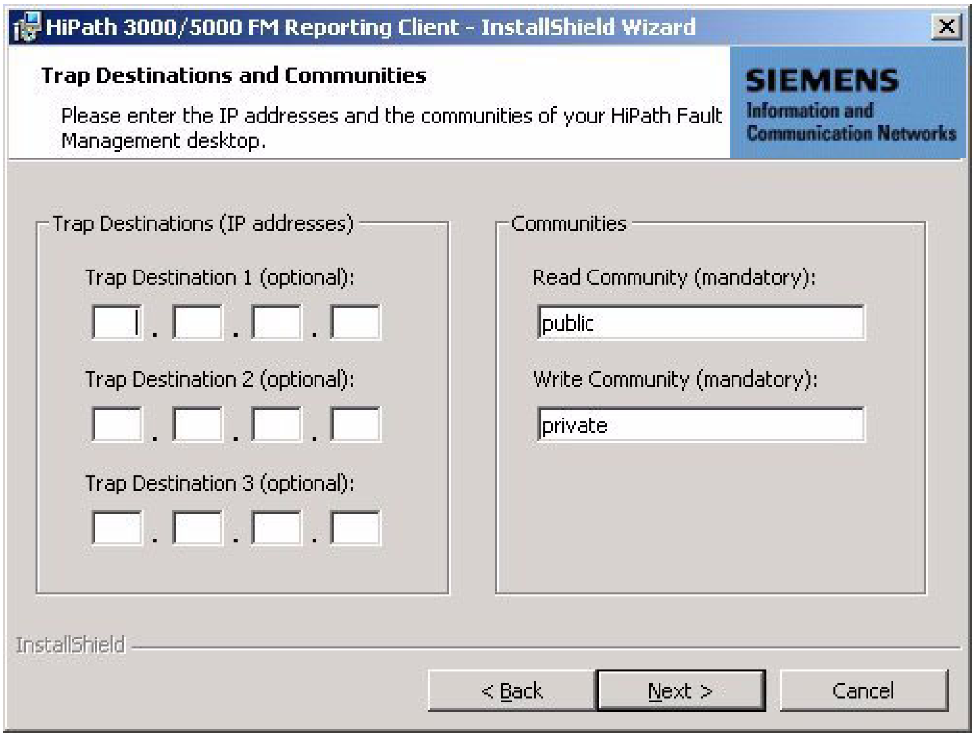
Select the folder where you want to install the program.

Confirm the default folder `c:\program files\siemens\hipath\tftp\files\` with **Next** or click **Change** to select a different folder.

10. Click **Next** to proceed with the setup routine.

    The **Trap Destinations and Communities** dialog appears.

    Note: This dialog only appears if none of the Master Setup components has been installed on the PC.



HiPath 3000/5000 FM Reporting Client - InstallShield Wizard

Trap Destinations and Communities

Please enter the IP addresses and the communities of your HiPath Fault Management desktop.

Trap Destinations (IP addresses)

Trap Destination 1 (optional): . . .

Trap Destination 2 (optional): . . .

Trap Destination 3 (optional): . . .

Communities

Read Community (mandatory): public

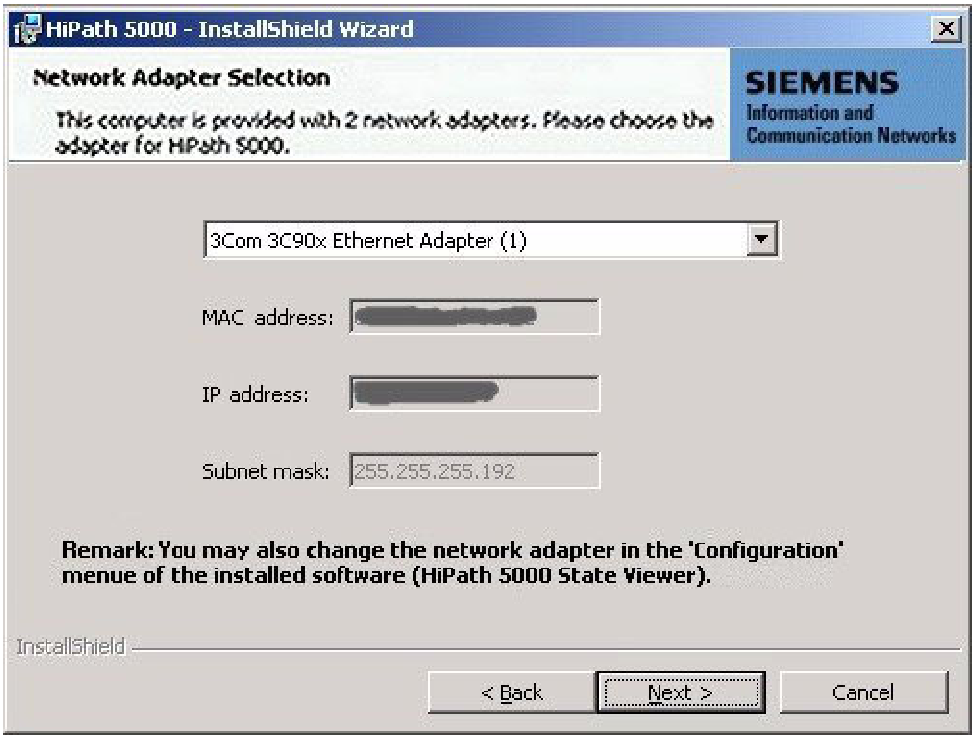
Write Community (mandatory): private

Enter the trap destinations (if necessary) and the HiPath Fault Management desktop community names.

11. Continue setup with **Next**.

    The **Select Network Card** dialog appears.

    Note: This dialog only appears if the relevant PC has more than one network card.


HiPath 5000 - InstallShield Wizard
SIEMENS
Information and Communication Networks
InstallShield
< Back
Next >
Cancel

Network Adapter Selection

This computer is provided with 2 network adapters. Please choose the adapter for HiPath 5000.

3Com 3C90x Ethernet Adapter (1)

MAC address: [redacted]

IP address: [redacted]

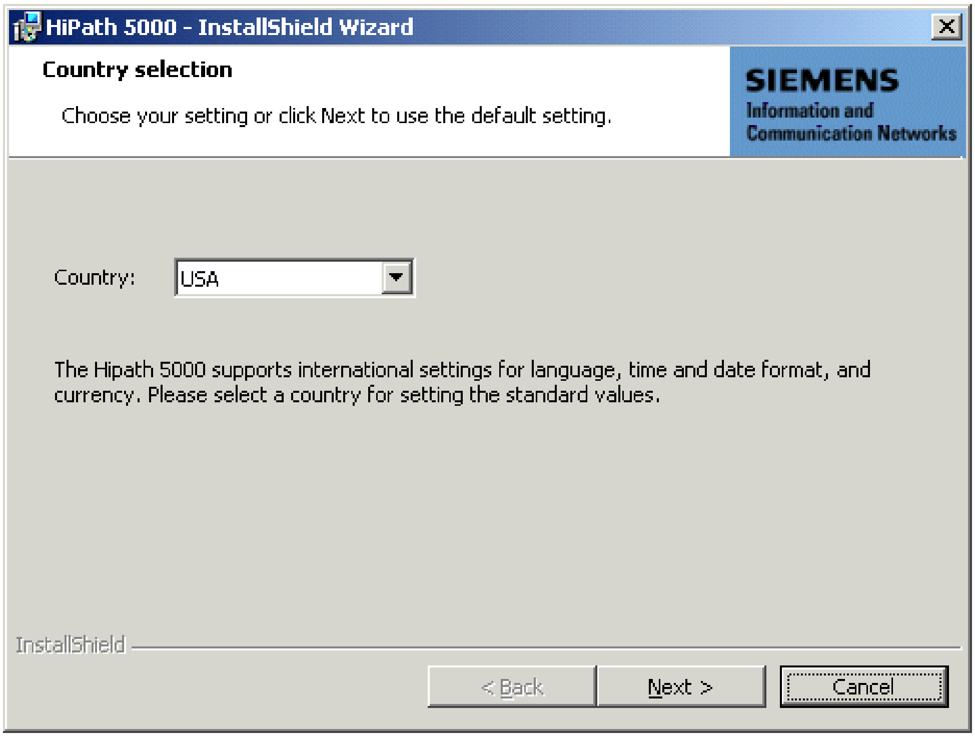
Subnet mask: 255.255.255.192

Remark: You may also change the network adapter in the 'Configuration' menue of the installed software (HiPath 5000 State Viewer).

Select the network card for HiPath 5000.

12. Continue setup with **Next**.

    The **Country selection** dialog appears.



HiPath 5000 - InstallShield Wizard
SIEMENS
Information and Communication Networks
InstallShield
< Back
Next >
Cancel

Country selection

Choose your setting or click Next to use the default setting.

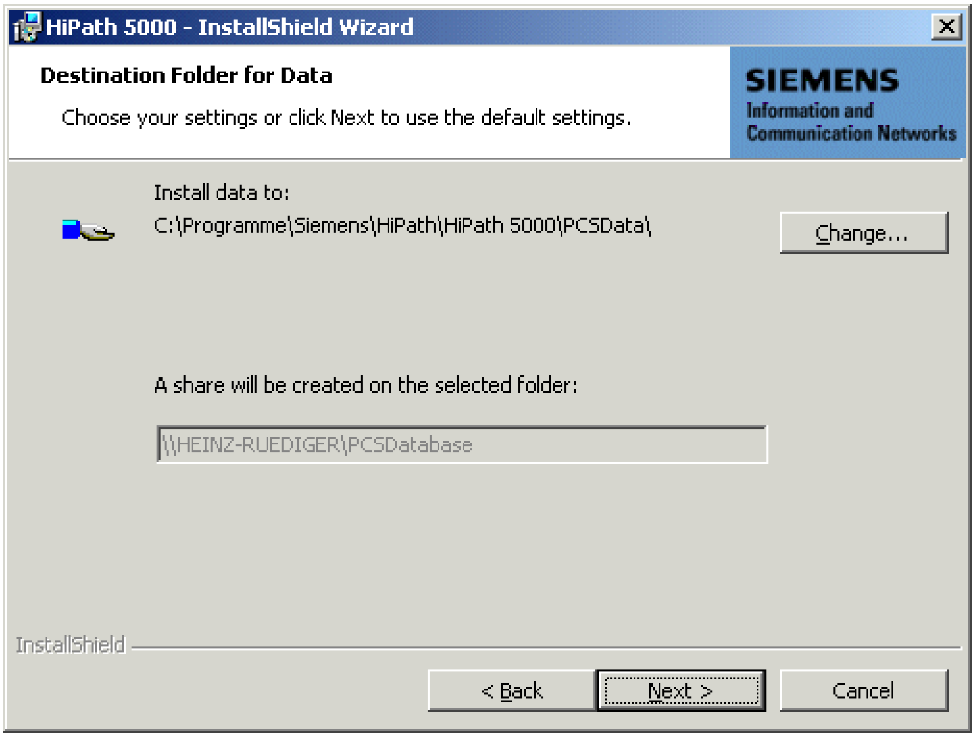
Country: USA

The Hipath 5000 supports international settings for language, time and date format, and currency. Please select a country for setting the standard values.

Confirm the default or select a different country to define the international standard settings for language, currency and date format.

13. Click **Next** to proceed with the setup routine.

    The **Destination Folder for Data** dialog appears.



HiPath 5000 - InstallShield Wizard

Destination Folder for Data

Choose your settings or click Next to use the default settings.

Install data to:
C:\Programme\Siemens\HiPath\HiPath 5000\PCSData\

A share will be created on the selected folder:

\\HEINZ-RUEDIGER\PCSDatabase

SIEMENS
Information and Communication Networks
Change...
InstallShield
< Back
Next >
Cancel

Select the folder for the HiPath ComScendo service data.

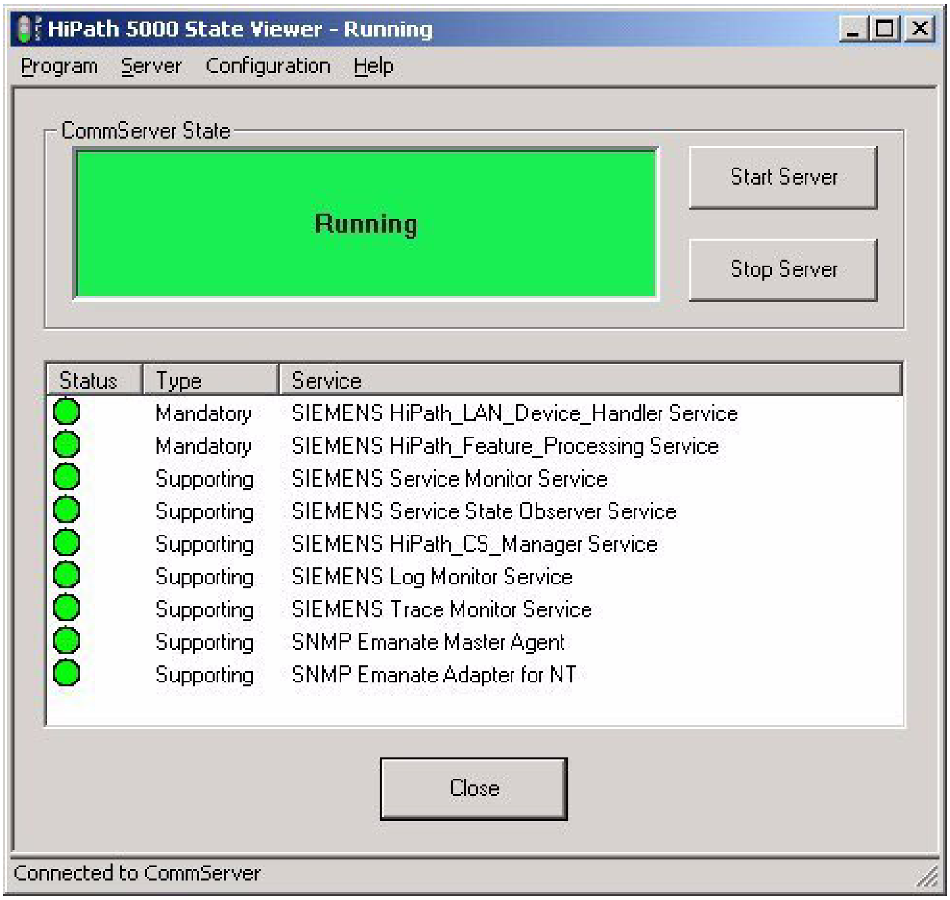
Confirm the default folder `c:\program files\siemens\hipath\hipath 5000\pcsdata\` with **Next** or click **Change** to select a different folder.

14. When all selected components are installed, a dialog appears in which you can terminate the installation with **Finish**.

6.6.4.1 Checking the Installation of the HiPath ComScendo Service

Procedure

1. Open the status display with `Start/Program Files/HiPath/HiPath 5000 State Viewer`.
2. The following appears:



CommServer State
Running

Status	Type	Service
●	Mandatory	SIEMENS HiPath_LAN_Device_Handler Service
●	Mandatory	SIEMENS HiPath_Feature_Processing Service
●	Supporting	SIEMENS Service Monitor Service
●	Supporting	SIEMENS Service State Observer Service
●	Supporting	SIEMENS HiPath_CS_Manager Service
●	Supporting	SIEMENS Log Monitor Service
●	Supporting	SIEMENS Trace Monitor Service
●	Supporting	SNMP Emanate Master Agent
●	Supporting	SNMP Emanate Adapter for NT

Connected to CommServer

Make sure that the server status is "Running" and that all service status indicators are green.

> Section 12.3.1.10 contains information about how to proceed in the event of a fault, in other words if one or more service status indicators are red.

Details about configuring the HiPath ComScendo service can be found in Section 6.10.1.

6.6.5 Installing HiPath Fault Management

HiPath Fault Management can read information from the HiPath 3000 and HiPath 5000 system MIB via SNMP requests. This allows the system to permanently monitor the status of the network components and to include changes of status in the network administrator information.

Procedure

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser. German (Germany) and English (USA) versions are currently available.

   The system is prepared for installation.

3. Click **Next** to start the installation routine.

   Important installation information is displayed.

   This includes the latest information on installation. Please read this information carefully.

4. Click **Next** to proceed with the installation routine.

5. **Select destination path**.

   Select the folder where you want to install the program.

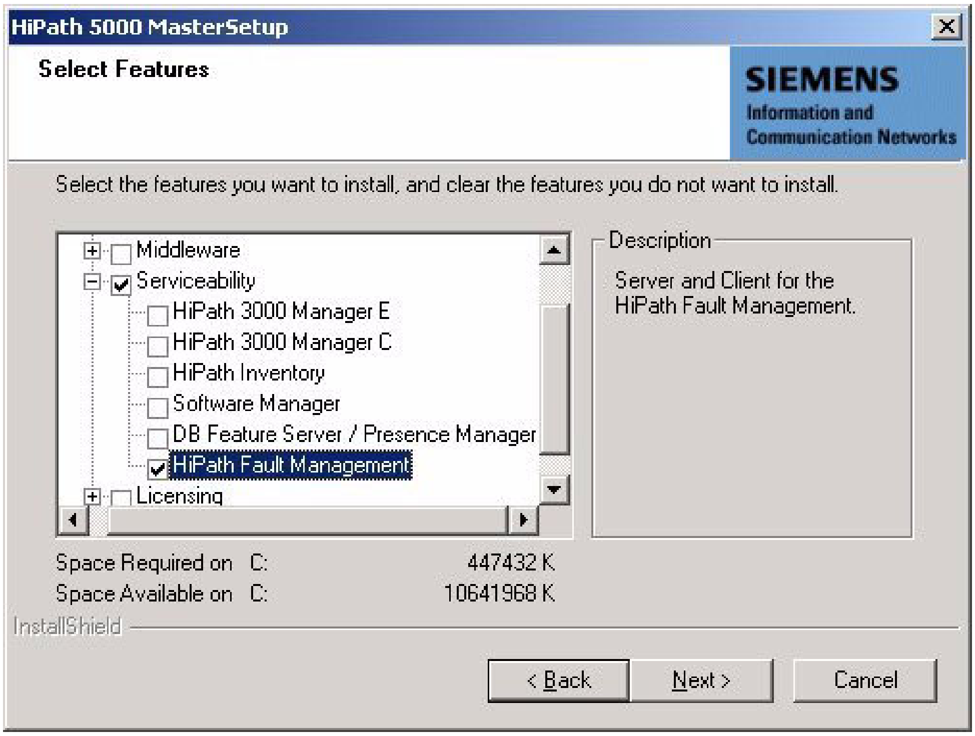
   Confirm the default folder `c:\program files\siemens\hipath\` with **Next** or click **Browse** and select a different folder.

6. **Select program folder**.

   Select the location where the setup should create the new shortcuts.

   Confirm the default folder `HiPath` with **Next** or select a different folder.

7. The **Select Features** dialog appears.



HiPath 5000 MasterSetup
SIEMENS
Information and Communication Networks

Select Features

Select the features you want to install, and clear the features you do not want to install.

- ☐ Middleware
- ☑ Serviceability
  - ☐ HiPath 3000 Manager E
  - ☐ HiPath 3000 Manager C
  - ☐ HiPath Inventory
  - ☐ Software Manager
  - ☐ DB Feature Server / Presence Manager
  - ☑ HiPath Fault Management
- ☐ Licensing

Description
Server and Client for the HiPath Fault Management.

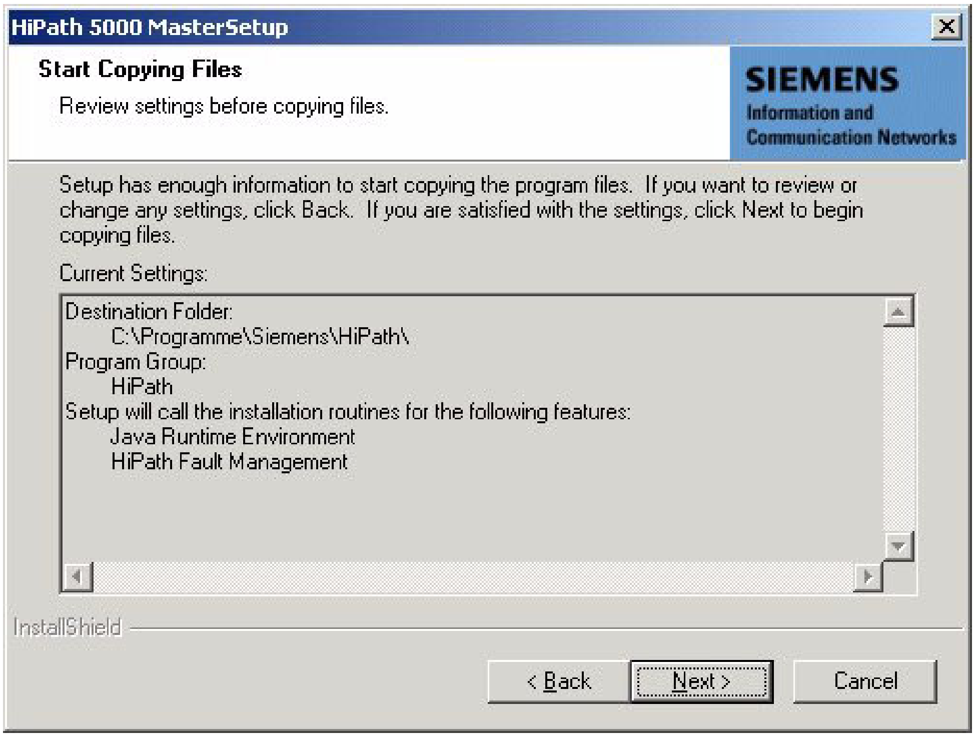
Space Required on C: 447432 K
Space Available on C: 10641968 K

InstallShield
< Back
Next >
Cancel

Select the HiPath Fault Management components you want to install and deselect the ones you do not want to install.

8. Then click **Next**.

   The **Start Copying Files** dialog appears.



Start Copying Files

Review settings before copying files.

Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.

Current Settings:

Destination Folder:
    C:\Programme\Siemens\HiPath\
Program Group:
    HiPath
Setup will call the installation routines for the following features:
    Java Runtime Environment
    HiPath Fault Management

   Check if the correct destination directory and program group are specified and if all necessary components are installed.

9. Click **Next** to start the copy procedure.

   The software license agreement is displayed. The license terms must be accepted before continuing with the setup.

10. Confirm the license agreement with **Yes**.

11. The **Choose Destination Location** dialog appears.

    Select the folder where you want to install the Java Runtime Environment.

    Confirm the default folder `c:\program files\javasoft\jre\<version>\` with **Next** or click **Browse** and select a different folder.

12. The **Select Browser** dialog appears.

    Select one of the available browsers for which the Java plugin is to be used as the standard runtime environment for Java.

13. Confirm your selection with **Next**.

    The **InstallShield Wizard for HiPath Fault Management** is started.

14. Click **Next** to proceed with the installation routine.

    The **licensing conditions for HiPath Fault Management** are displayed. The license terms must be accepted before continuing with the installation.

    Click **I accept the terms of the license agreement**.

15. Click **Next** to proceed with the installation routine.

    The **installation options** are displayed.

    Select the **Server & Client** option.

16. Continue installation with **Next**.

    The **Directory Name** dialog is displayed.

    Confirm the name suggested with Next or click Browse to select a different directory.

17. Once installation is complete, a final dialog appears. Close the InstallShield Wizard for HiPath Fault Management with **Finish**.

18. A message appears indicating that the master setup has been successful. Close the setup with **Finish**.

6.6.6 Installing the TAPI Service Provider

This section describes the separate installation of the TAPI Service Provider.

The numbers for stations, trunks, and groups can be set up directly after installation of the TAPI Service Provider.

1. Insert the TAPI Service Provider installation CD and run Setup.
2. Confirm the welcome dialog that appears with **Next**.
3. The Setup Type dialog appears. Mark HiPath 3000/5000 V5.0 and confirm your selection with **Next**.

   The appropriate installation components are automatically preselected when you select the setup type. The following are installed for HiPath 3000/5000 V5.0:

   - TAPI Service Provider TSP
   - CSTA Message Dispatcher CMD
   - CSTA Service Provider CSP
   - Central Configuration Manager Client CCMC
4. The system starts to install the selected components.

   When a component is successfully installed, the associated configuration dialog opens. You can set the required parameters here or postpone configuration until a later time. For further information, please refer to the online help for the TAPI Service Provider.
5. When all selected components are installed, a dialog appears in which you can terminate the installation with **Finish**
6. Confirm the subsequent system message to enable the ACD service if the Call Center application HPCO is connected.

The TAPI service provider is now installed. For further information, please refer to the online help for the TAPI Service Provider.

6.6.7 Installing the HiPath Inventory Server Separately

The software components and tools of the master setup mentioned in Table 6-6 can be installed on several PCs. In such a scenario the Inventory Server should be installed on all PCs that are to support the HiPath Inventory Manager.

Procedure

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser. German (Germany) and English (USA) versions are currently available.

   The system is prepared for installation.

3. Click **Next** to start the installation routine.

   Important installation information is displayed.

   This includes the latest information on installation. Please read this information carefully.

4. Click **Next** to proceed with the installation routine.

5. **Select destination path**.

   Select the folder where you want to install the program.

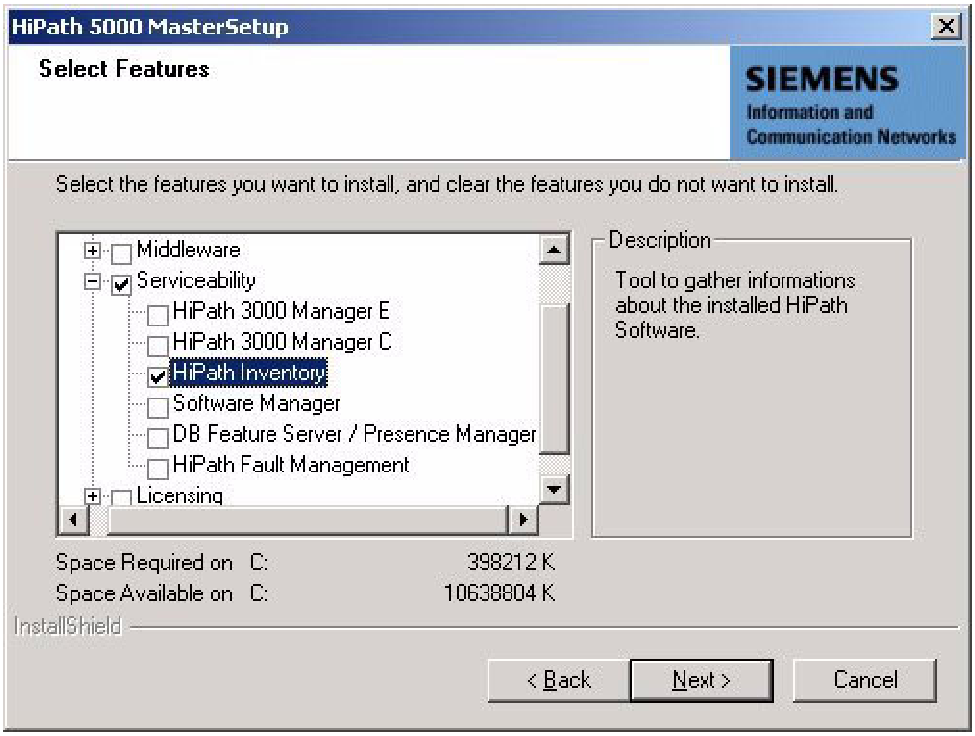
   Confirm the default folder `c:\program files\siemens\hipath\` with **Next** or click **Browse** and select a different folder.

6. **Select program folder**.

   Select the location where the setup should create the new shortcuts.

   Confirm the default folder `HiPath` with **Next** or select a different folder.

7. The **Select Features** dialog appears.



HiPath 5000 MasterSetup

Select Features

Select the features you want to install, and clear the features you do not want to install.

- ☐ Middleware
- ☑ Serviceability
  - ☐ HiPath 3000 Manager E
  - ☐ HiPath 3000 Manager C
  - ☑ HiPath Inventory
  - ☐ Software Manager
  - ☐ DB Feature Server / Presence Manager
  - ☐ HiPath Fault Management
- ☐ Licensing

Description

Tool to gather informations about the installed HiPath Software.

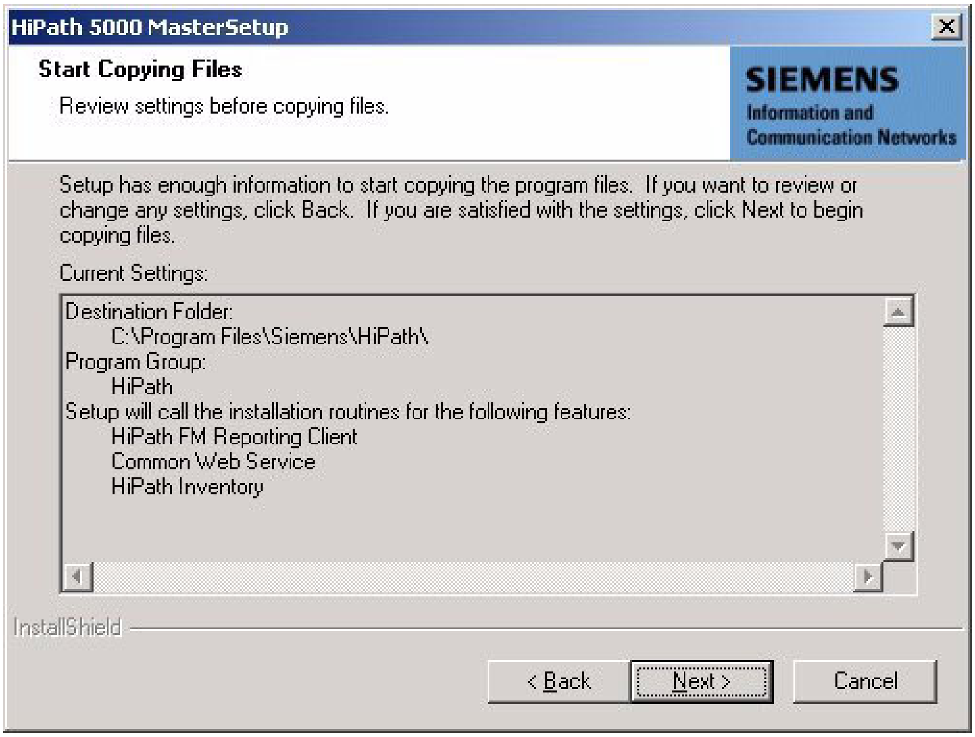
Space Required on C: 398212 K
Space Available on C: 10638804 K

SIEMENS
Information and Communication Networks
InstallShield
< Back
Next >
Cancel

Select the HiPath Inventory components you want to install and deselect the ones you do not want to install.

8. Then click **Next**.

   The **Start Copying Files** dialog appears.



HiPath 5000 MasterSetup
Start Copying Files
Review settings before copying files.
SIEMENS
Information and Communication Networks

Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.

Current Settings:

```
Destination Folder:
      C:\Program Files\Siemens\HiPath\
Program Group:
      HiPath
Setup will call the installation routines for the following features:
      HiPath FM Reporting Client
      Common Web Service
      HiPath Inventory
```

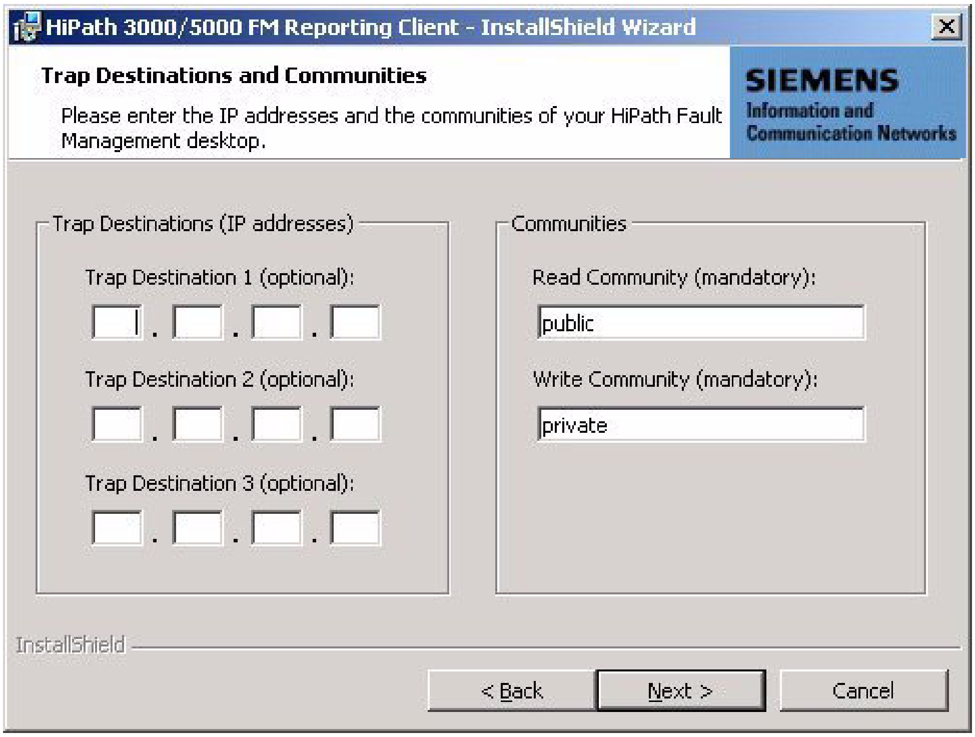
InstallShield
< Back
Next >
Cancel

Check if the correct destination directory and program group are specified and if all necessary components are installed.

To be able to implement the setup for HiPath Inventory, both an FM Reporting client and a Common Web Service must be installed on the relevant PC. Both components are automatically selected and installed by the Master Setup.

9. Click **Next** to start the copy operation.

   The **Trap Destinations and Communities** dialog appears.


HiPath 3000/5000 FM Reporting Client - InstallShield Wizard
SIEMENS
Information and Communication Networks
InstallShield
< Back
Next >
Cancel

Trap Destinations and Communities

Please enter the IP addresses and the communities of your HiPath Fault Management desktop.

Trap Destinations (IP addresses)

Trap Destination 1 (optional): . . .

Trap Destination 2 (optional): . . .

Trap Destination 3 (optional): . . .

Communities

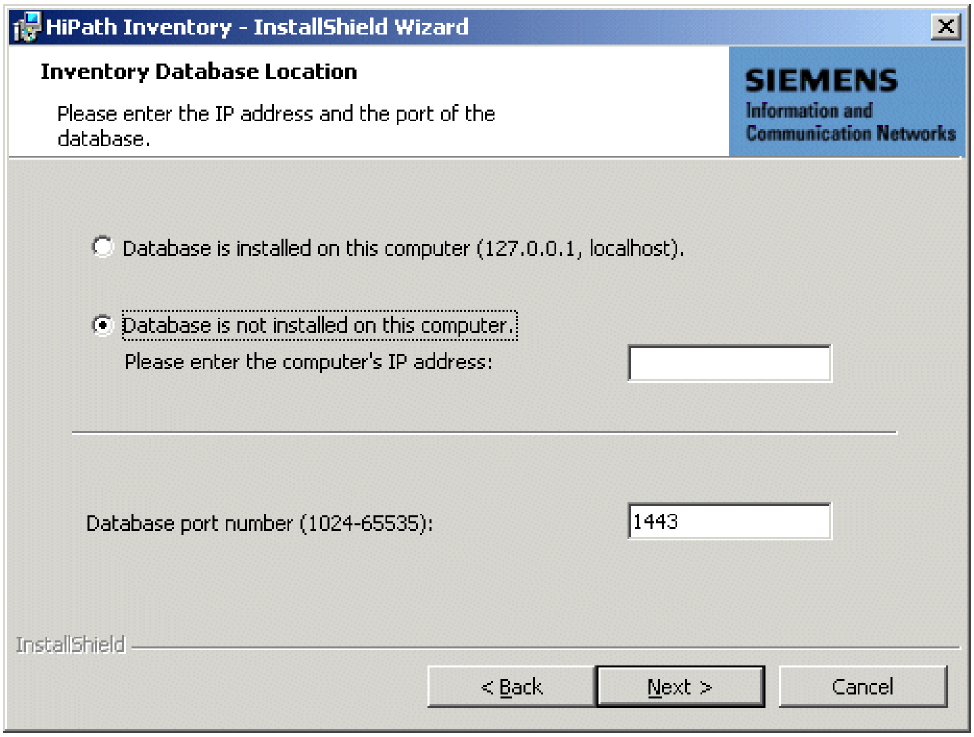
Read Community (mandatory): public

Write Community (mandatory): private

Enter the trap destinations (if necessary) and the HiPath Fault Management desktop community names.

10. Click **Next** to proceed with the installation routine.

    The **Inventory Database Location** dialog appears.



HiPath Inventory - InstallShield Wizard

Inventory Database Location

Please enter the IP address and the port of the database.

○ Database is installed on this computer (127.0.0.1, localhost).

● Database is not installed on this computer.

Please enter the computer's IP address:

Database port number (1024-65535): 1443

Enter the IP address and the port number of the PC where the database is installed (MSDE SQL database server).

11. Confirm your entries with **Next**.
12. When installation is complete, a dialog appears in which you can terminate the setup with **Finish**.

6.6.8 Verifying Installation

Computer Management can be used to verify that all components are correctly installed. This is included in NT-based operating system packages (MS Windows NT, MS Windows 2000, MS Windows XP, etc.).

To start this component, select `Settings - Control Panel - Administrative Tools - Computer Management`.

This program is a sophisticated desktop tool for performing remote maintenance on computers. Possible actions include the following:

- monitoring system events, for example, logon times and application errors.
- creating and managing releases
- starting and ending system services, for example task schedulers and spoolers.
- defining properties for memory devices
- displaying device configurations and adding new device drivers
- administering server applications and services, for example, DNS (Domain Name System) or DHCP (Dynamic Host Configuration Protocol).

Computer Management is displayed in a separate window, like Windows Explorer. The console structure (for the navigation and service program selection) contains the system programs, data memory, services, and applications available on the computer. The right pane - the event area - shows the tool’s attributes and data as well as any subordinate tools available.

> Administrator user rights are required to use the full range of Computer Management functions.
> Working with Computer Management requires an appropriate level of familiarity with the operating system.

6.6.8.1 Verifying the Start and Function of HiPath 5000 Services

Select `Computer Management - Services and Applications - Services` to check if all necessary services were started.

6.6.8.2 Checking Entries in the Event Viewer

The Event Viewer (event log) provides status information on the HiPath 5000 server and any application servers available.

All events associated with the server(s) and its (their) applications are saved. The events provide a quick and, above all, time-specific overview of all relevant actions (status, information, warning, error, etc.).

To open the Event Viewer, select `Computer Management - System Tools - Event Viewer`.

For more information, see Section 12.3.1.9, “Event Viewer for HiPath 5000 (Eventlog)”. Table 12-8 shows the possible entries that may appear in the Event Viewer.

6.7 Modifying HiPath 5000 Components (Retro-Fitting, Updating, Deleting)

The Setup maintenance program can be used for

- retro-fitting,
- updating and
- removing

components associated with the current HiPath 5000 V5.0 installation.

When activated, the Setup creates the relevant selection lists based on the current HiPath 5000 V5.0 installation.

The WinAccount software for evaluating call data records is no longer used in HiPath 3000/5000 V4.0 or later.
Call data records must be evaluated with WinAccount before starting an update because updating uninstalls the WinAccount application.
Refer to the WinAccount user manual for information about the procedure

⚠ The TAPI Service Provider configuration (configuration and lines - refer to the TAPI 170 Service Provider Help) and the CDB files associated with the connected systems (refer to the Help for HiPath 3000 Manager E) should be saved for security reasons.

Procedure

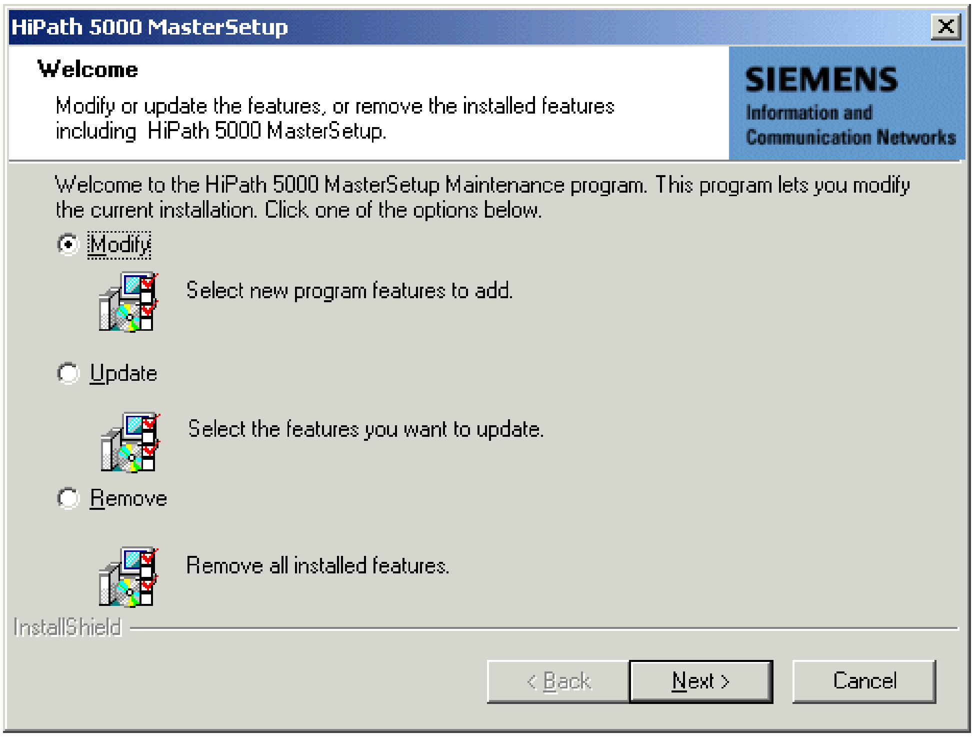
> All active applications must be closed down before an update. Close the database server via the **Task Manager** and use the **Services Control Manager** to exit the telephony services and Feature Server.

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser.

3. The Setup maintenance program appears.



HiPath 5000 MasterSetup

Welcome

Modify or update the features, or remove the installed features including HiPath 5000 MasterSetup.

Welcome to the HiPath 5000 MasterSetup Maintenance program. This program lets you modify the current installation. Click one of the options below.

● Modify

Select new program features to add.

○ Update

Select the features you want to update.

○ Remove

Remove all installed features.

   Mark the option you want and confirm with Next.

4. Follow the on-screen user prompts.

You must restart your PC after updating the HiPath 5000 V5.0 installation.

6.8 Performing Licensing

Version 5.0 and later features a new, centralized licensing procedure, called HiPath License Management. The procedure is used in all HiPath products, for example communication systems, workpoint clients, and applications.

A grace period of 30 days begins when HiPath 5000 is started up. Licensing must be performed for all features, interfaces, and products subject to mandatory licensing within this grace period.

HiPath 3000 Manager E comes with a customer-specific file which is used by the Customer License Agent CLA to generate a GPCF (Grace Period Configuration File) file. This file ensures that the maximum expansion of all features subject to mandatory licensing is possible within the 30-day grace period. The system or systems are not licensed.

The system falls into licensing default if licensing is not performed within the 30-day grace period. This means that features which subject to mandatory licensing will suffer from reduced functionality.

Please refer to **Chapter 8, “Licensing”** for information on how to proceed.

6.9 Optimizing Operating System Settings

This section describes how you can optimize the Windows 2000 Server operating system for the implementation of HiPath 5000.

No information is available on how to optimize Windows Server 2003.

Table 6-7 Operating System Settings for HiPath 5000

Component	Description
Optimizing the physical memory	Windows 2000 Server is normally optimized for maximum throughput as a file server. For a HiPath 5000 server, however, significantly less memory is needed for the system-wide disk cache. For this select the **Balance Load** option under `Start/Settings/Network and DC Connections/LAN Connection: Properties – File and Printer Sharing for Microsoft Networks: Properties`
Optimizing the virtual memory	To optimize the virtual memory, enter 512 MB as the **Total paging file size for all drives** under `Start/Settings/Control Panel/System: Advanced – Performance Settings: Virtual Memory: Change`. The same values should be entered for the virtual memory's upper and lower thresholds so that the paging file does not have to be extended during operation.
Optimizing availability	If the operating system crashes (blue screen), it creates a file containing debugging information from the paging file the next time the system starts. If the size of this file is the same size as the system's physical memory, almost all of the virtual memory will be used for generating this file during system startup. This may cause certain services on the HiPath 5000 server to experience problems in starting up. To recover this problem, you should go to `Start/Settings/Control Panel` – `System` – **Advanced** – **Startup and Recovery** and select the option none under Write Debugging Information. All other options are viable. The **Auto restart** option forces an automatic restart in the event of a system crash, thus considerably increasing the server's availability.
SMTP service	The operating system's SMTP service should always be disabled as HiPath 5000 provides its own SMTP link which may conflict with the operating system's service. To do this, go to `Start/Settings/Control Panel: Software – Add/Remove Windows Components : Internet Information Service (IIS) – Details`: **Remove SMTP Service**.
Personal Call Manager and Internet Information Server	

Table 6-7 Operating System Settings for HiPath 5000

Component	Description
	The Personal Call Manager software runs within the context of the IIS user. When a Windows Server system is being installed for the first time, it must be taken into account that the default security settings for the **wwwroot** directory do not always grant the Personal Call Manager the necessary access rights. You must ensure that the user account used by the Personal Call Manager (account for "anonymous access" on the standard website - by default this is the IIS guest account `IUSR_<PC name>`) has full access to the `wwwroott\PCM` directory. The PCM requires the following local full access rights to the hard disk: `C:\temp and C:\InetPub\wwwroot\PCM\` where `C:\InetPub\wwwroot` means the standard directory of the IIS (in other installations this may have a completely different name).
	The option “Cache ISAPI Applications” **must not** be disabled. This option can be found under **Standard website** – **Properties** – **Home Directory** – **Configuration** – **Application Mapping**. If the option were disabled, the Personal Call Manger would lose its “memory” of the users currently logged on and the error message “You are not logged on” would be displayed permanently ...”.
Application protocol	Configure the following by right-clicking Properties under System Log and Application Log in the operating system’s Event Viewer: 'Overwrite events as needed' and set 'Maximum log size' to approximately 2 MB.

6.10 Perform HiPath 5000 Basic Configuration

A distinction should be drawn between the basic configuration of a

- HiPath 5000 PC with HiPath ComScendo service
  The HiPath ComScendo Service is virtually a complete HiPath 3000 node that is only configured as software on a PC. Apart from the pure TDM features, all features of V5.0 are available.

  HiPath ComScendo Service is administered over HiPath 3000 Manager E, while the HG 1500 resources (see Page 10-38) are administered over Web-based Management (WBM).

- HiPath 5000 server as central administration unit in an IP network, with or without HiPath ComScendo Service .The formation of a “single system image” allows the central administration of all associated nodes (HiPath 3000 and HiPath 5000 with HiPath ComScendo Service).

  The IP network is administered via the Feature server. The HiPath 3000 Manager E administration tool does not communicate with the individual nodes but exchanges data with the Feature server. The Feature server ensures that the networked nodes receive synchronized CDB data. The Feature Server is an MS Windows service that automatically starts at the same time as the HiPath 5000 server.

  HG 1500 boards are still administered on a board-specific basis using Web-based management (WBM).

  The administration of IP networking with HiPath 3000 Manager E is divided into the following steps:

  a) Configuring the individual nodes belonging to the network (HiPath 3000 and HiPath 5000 with HiPath ComScendo Service) = Configuration of the individual customer databases.

  b) Configuring the Feature server = Create an empty server net file.

  c) Start data transfer = registration of the individual nodes and transfer of the node data to the server net file.

  d) Transfer the central database for IP networking = Load the server net file to the Feature server. The customer database is then automatically distributed to the various nodes.

  Future administrative node work is then performed by the server.

6.10.1 Configuring HiPath 5000 with HiPath ComScendo Service

The customer database must be loaded to enable the individual IP workpoint clients, trunks, etc. to be configured.

Procedure

1. StartHiPath 3000 Manager E.
2. Open the **Transfer** dialog using the **File** menu.
3. In the Communication Settings tab select **IP-HiPath** as the access and enter the **IP address** of the HiPath 5000 with HiPath ComScendo Service in the appropriate field.

   Select **Read/Write CDB** and load the customer database by clicking the **System -> PC button.**

   > During the first login, the system requests the identity of the user and asks for a new password (for more information see Section 12.6.1.1, “Logon With User Name and Password”).

4. Perform the customer-specific system programming.
   Refer to the HiPath 3000 Manager E Help for information on programming individual features.
5. Save the customer database.
6. Then switch to the **Transfer** dialog.
7. In the Communication Settings tab select **IP-HiPath** as the access and enter the **IP address** of the HiPath 5000 with HiPath ComScendo Service in the appropriate field.

   Select **Read/Write Database**. Set the **Overwrite** and **Hardware** flags and transfer the customer database by clicking the **PC –> System** button.

   Once transfer is complete, HiPath 5000 automatically performs a reset and then returns to operation.

> The HG 1500 resources (see Page 10-38) are to be administered with Web-based Management (WBM). Information about the procedure can be found in the Web-based Management WBM Help.

6.10.2 Configuring HiPath 5000 Server as a Central Administration Unit in an IP Network

The IP network is administered via the Feature server. The HiPath 3000 Manager E administration tool does not communicate with the individual nodes but exchanges data with the Feature server. The Feature server ensures that the networked nodes receive synchronized CDB data. To facilitate this, a central customer database, the so called server net file, must be created for IP networking.

6.10.2.1 Creating a Central Customer Database for IP Networking

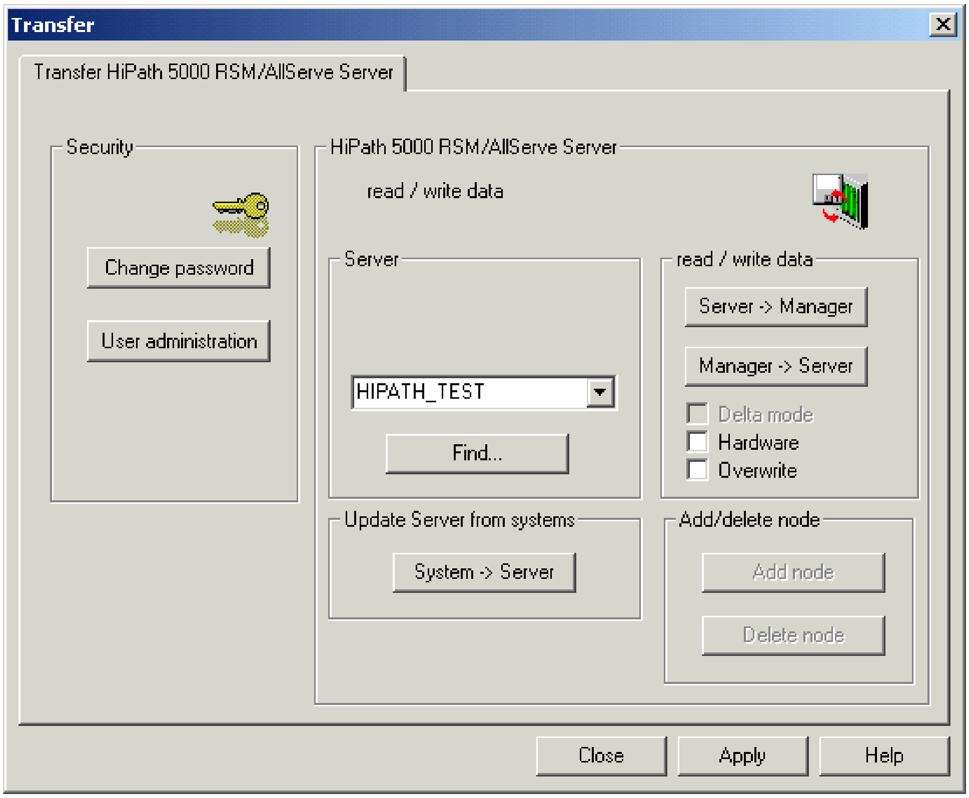
An empty server net file must be created in order to create a central customer database for IP networking.

Procedure

1. StartHiPath 3000 Manager E.
2. Activate the **HiPath 5000/AllServe server** by selecting **File - HiPath 5000/AllServe - Transfer** or via the appropriate button in the toolbar.

> The menu item **File - HiPath 5000/AllServe - New - HiPath 5000/AllServe Server** is only used to create a CDB memory generated offline.

3. The **Transfer** (HiPath 5000/AllServe Server) dialog appears.


Transfer
Transfer HiPath 5000 RSM/AllServe Server
Security
Change password
User administration
HiPath 5000 RSM/AllServe Server
read / write data
Find...
read / write data
Server -> Manager
Manager -> Server
Update Server from systems
System -> Server
Add/delete node
Add node
Delete node
Close
Apply
Help

Server: HIPATH_TEST

☐ Delta mode
☐ Hardware
☐ Overwrite

4. The PC to be used as the HiPath 5000 server should be entered in the **Server** field.

   Note: If the required software is not installed on the specified PC, the error message "HiPath 5000/AllServe Server not Installed on this PC" appears.

5. Load the central customer database by clicking the **Server –> Manager** button.

6. Then click **Close**.

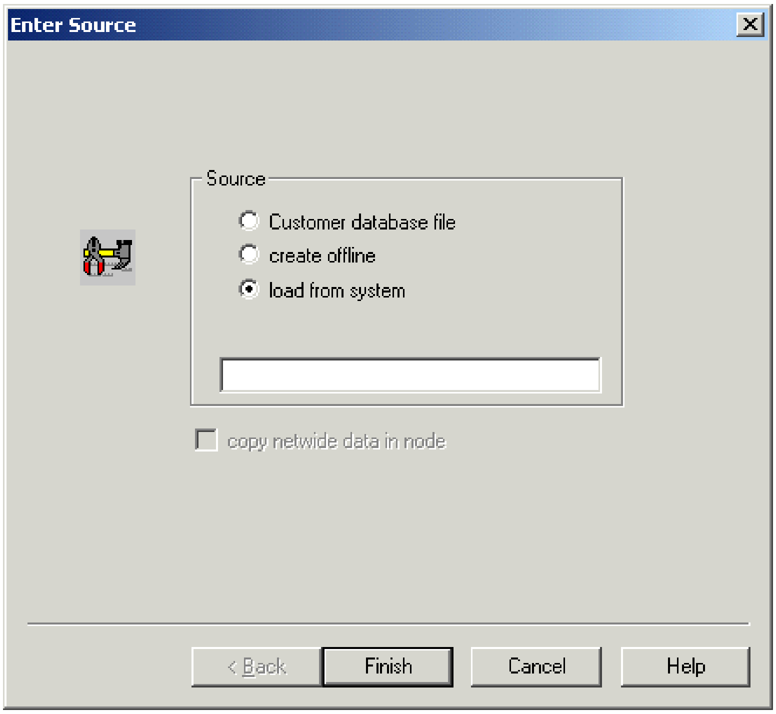
6.10.2.2 Adding Individual Nodes for IP Networking

The next steps in creating a central database for IP Networking are the registration of the individual nodes and the transfer of the node data to the server net file. The server net file is now loaded to the Feature server. The customer database is then automatically distributed to the various nodes.

The prerequisite for adding nodes (HiPath 3000) to a HiPath 3000/5000 network is the successful installation (see **Chapter 4, “Installing HiPath 3000”**) and startup (see **Chapter 5, “Starting Up HiPath 3000”**) of these systems.

Procedure

1. To select the node to be added to the CDB, call **File - HiPath 5000/AllServe - New - HiPath 3000**.
2. The **Enter Source** dialog appears.



Enter Source

Source
○ Customer database file
○ create offline
● load from system

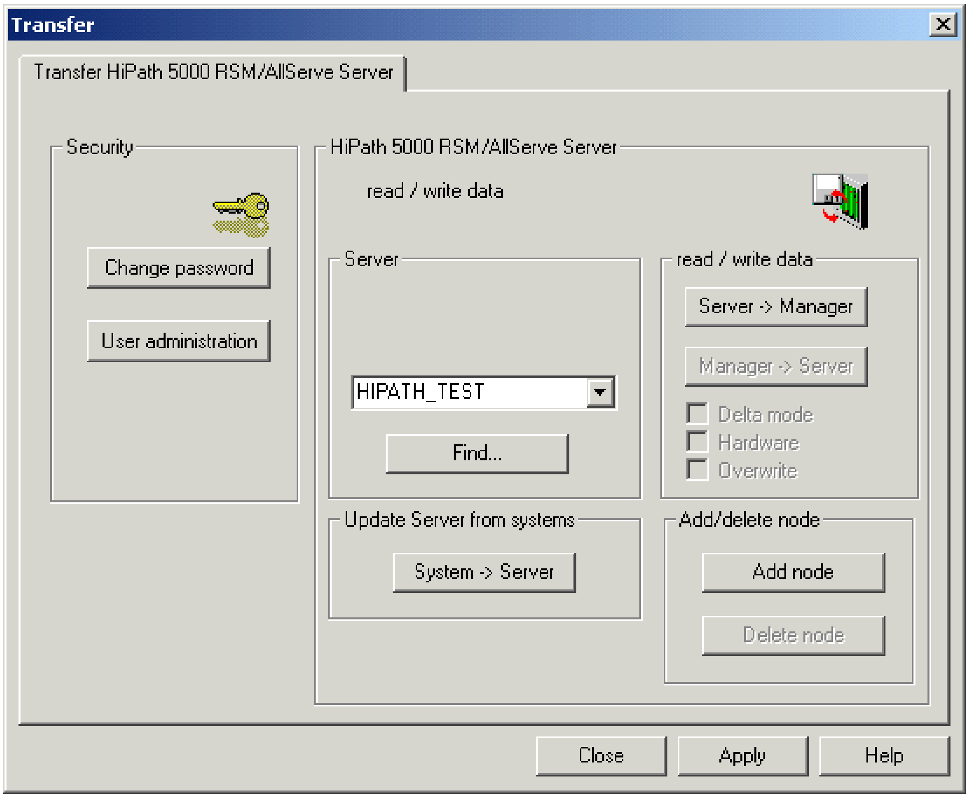
☐ copy netwide data in node

3. Select the appropriate source:
   - Customer database file
     To open a saved CDB file.
   - create offline
     An offline generated CDB is created.

- load from system
  To load a CDB directly from a node.

If the **Copy netwide data in node** option is activated, the service and substitution codes are copied from the CDB firstly created to all other CDB files of the node belonging to IP networking.

4. Confirm the selection of the source with the **Finish** button.
5. To add the node, invoke **File - HiPath 5000/AllServe - Transfer - HiPath 5000/AllServe Server**.
6. The **Transfer** (HiPath 5000/AllServe Server) dialog appears.


Transfer
Transfer HiPath 5000 RSM/AllServe Server
Security
Change password
User administration
HiPath 5000 RSM/AllServe Server
read / write data
Server
HIPATH_TEST
Find...
read / write data
Server -> Manager
Manager -> Server
☐ Delta mode
☐ Hardware
☐ Overwrite
Update Server from systems
System -> Server
Add/delete node
Add node
Delete node
Close
Apply
Help

Apply the node data to the server net file by clicking the **Add node** button.

7. Finally, rewrite the data from HiPath 3000 Manager E to the HiPath 5000 server (**Manager –> Server** button).

Refer to the Help for HiPath 3000 Manager E for additional information about the procedure.

6.11 HiPath Manager PCM

For information, see the HiPath Manager PCM Installation and Administration Manual.

6.12 GetAccount

Overview

The call data records generated during HiPath 3000/5000 operation can be copied to a text file for further processing using the GetAccount program.

> The WinAccount software for evaluating call data records is **no longer** used in HiPath 3000/5000 V4.0 or later.

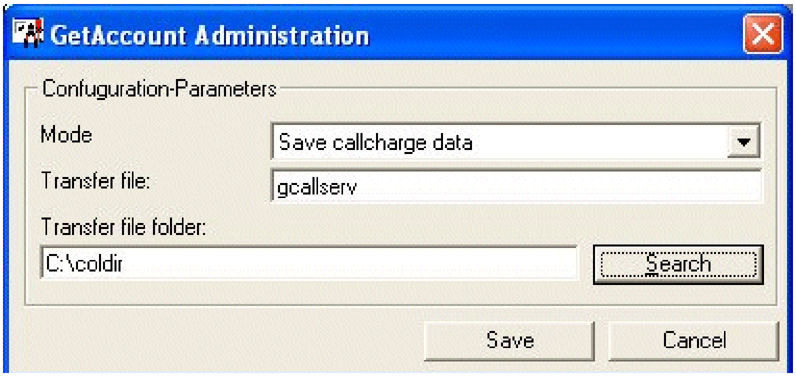
6.12.1 Parameters for Call Data Export

For HiPath 5000, you can forward the existing call data, for example, for external call charge calculation. The call data is forwarding in an ASCII file.

Proceed as follows to set the parameters for call data export:

1. Start the **GetAccount Administration** program.

   The following dialog appears.



Mode: Save callcharge data
Transfer file: gcallserv
Transfer file folder: C:\coldir

2. Enter the following data:

Field name	**Meaning**
Mode	Select the call data forwarding mode in this list field. The following modes are available: ● None save call charge data The call data is not written to the transfer file. Select this option. ● Save call charge data The call data is written to the transfer file. The modes Export calls with calculation and Export and save calls with calculation are intended for a future expansion.
Transfer file	Confirm the default file name (`gcallserve`) or enter a different file name.
Transfer file folder	Confirm the default folder name (`C:\coldir`) or enter a different folder name. The transfer file is stored in the folder set here.

3. Click **Save** to save your inputs.

   The changes you made only become effective after the GetAccount service is restarted.

   The ASCII transfer file is automatically saved in the specified folder and extended to include the new call data. The file is extended by one line for each call data record. Each call data record (line) is ended with `CR+LF`.

Data record structure

Table 6-8 GetAccount - Data Record Structure

No.	Pos.	Length	Description
1	1 - 8	8	Date of call end Format DD.MM.YY, for example "13.09.00"
2	9 - 16	8	Time of call end Format hh:mm:ss, for example "14:14:00"
3	17 - 19	3	Trunk number right-aligned with leading blanks, for example " 1"
4	20 - 22	3	Node ID for HiPath 3000 (matches the configuration in HiPath 3000 Manager E) right-aligned with leading blanks
5	23 - 28	6	Internal extension number right-aligned with leading blanks
6	29 - 33	5	Call duration in seconds
7	34 - 41	8	Call duration Format hh:mm:ss, for example "00:04:34
8	42 - 66	25	● For incoming calls: external caller number ● For outgoing calls: external call number dialed including the call-by-call number left-aligned with succeeding blanks
9	67 - 77	11	Number of tariff units right-aligned with leading blanks
10	78	1	Call type ● 1: incoming ● 2: outgoing (default)
11	79 - 89	11	Account code ACCT left-aligned with succeeding blanks
12	90 - 100	11	MSN used
13	101 - 105	5	Trunk right-aligned with leading blanks
14	106 - 109	4	LCR Selected Route (corresponds to configuration in HiPath 3000 Manager E) right-aligned with leading blanks
15	110	1	`CR`

Table 6-8 GetAccount - Data Record Structure

No.	Pos.	Length	Description
16	111	1	`LF`

Copying/renaming the transfer files

Proceed as follows if you want to use the call information in the transfer file for external processing:

- Switch to the folder containing the transfer file (default: `C:\coldir`).
- Rename the transfer file (default: `gcallserve`). The renamed file is now available for external processing.
- The transfer file is automatically recreated in the specified folder with the file name saved in the parameters and can be renamed again at a later point.

To avoid uncontrolled folder growth with the transfer file, an option is available for deleting the renamed transfer file after forwarding it for external use in this folder.

6.13 Connecting an Uninterruptible Power Supply to HiPath 5000

Online’s P 500 uninterruptible power supply (UPS) was certified for use with HiPath 5000.

The P 500 UPS is fed through the AC power cord to the HiPath 5000 server. The device bridges power failures lasting 5 - 10 minutes by means of an integrated battery.

> ⚠ **Caution**
> For safety reasons and for protection against guarantee claims, changes to the UPS settings may only be performed by specially trained technicians.
> The manufacturer’s safety and operating instructions must be observed.

P 500 UPS - Front and Rear Panel

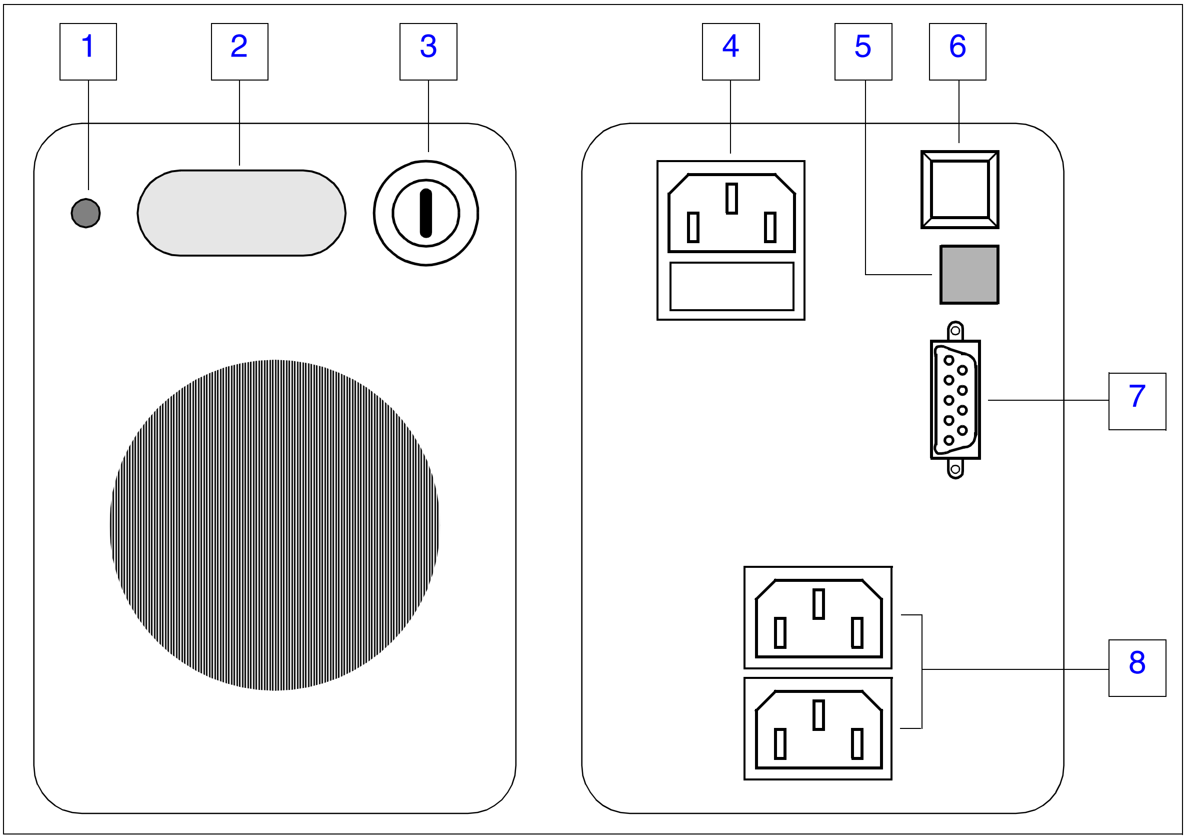


Figure 6-4 P 500 UPS - Front and Rear Panel

P 500 UPS - Meaning of Displays, Switches and Jacks

Table 6-9 P 500 UPS - Meaning of Displays, Switches and Jacks

No.	Description
1	LED displays the status of the P 500 UPS. ● green = input voltage (line voltage) is functioning ● red = UPS is suppling voltage or fault has been detected
2	Display shows UPS operating status ● NORMAL ● CHARG'G ● BATTERY and reports the charging status of the battery (25, 50, 75 or 100%).
3	On/off switch
4	Input (jack for input voltage (line voltage)) There is a cavity under the jack for the input fuse (with spare fuse enclosed).
5	3-pin DIP-FIX switch: ● 1: reduces the response voltage (minimum line voltage value before UPS activation) – 10 V with 220/240-V systems – 5 V with 110/120-V systems. ● 2: increases the response voltage by 5% ● 3: reduces the response voltage by 5% Switch positions normally: DIP FIX 1 = off, DIP FIX 2 and 3 = on
6	Reset key ● deactivates the acoustic alarm if the input voltage fails, that is, when using the UPS. This alarm cannot be deactivated if the battery voltage falls under a certain value. ● activates the UPS cold start. To protect the battery from deep discharging, the UPS can only be activated when the line voltage is connected. By activating the "on" switch (1) and then pressing the reset key, the P 500 UPS can also be activated without a network connection (cold start). The connected server must be disconnected before a cold start. The P 500 UPS needs between 5 and 20 s to reach the set output voltage. To avoid malfunctions the connected server should not be connected immediately.
7	9-pin jack for connection to the communication server **NOT USED IN HiPath 3000/5000.** Special monitoring software can shut down the specified server via this jack, for example, in the case of extended power failures.
8	Jacks for power supply to the communication server to be monitored.

7 Starting HiPath 3000 as a Gateway

7.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Starting HiPath 3800 as a Gateway, page 7-2
Starting HiPath 3700 as a Gateway, page 7-4
Starting HiPath 3500 as a Gateway, page 7-6
Starting HiPath 3300 as a Gateway, page 7-8

7.2 Introduction

So-called gateways provide the HiPath 5000 with interfaces for trunk and tie trunk connections to the telecommunications network. In V5.0, the HiPath 3800, HiPath 3700, HiPath 3500, and HiPath 3300 systems can be used as gateways.

7.3 Starting HiPath 3800 as a Gateway

7.3.1 Prerequisites

> **Warning**
> Only authorized service personnel should install and start up the system.

Refer to Section 4.2.1 for information on the tools and resources needed to install the HiPath 3800 system.

7.3.2 Procedure for Installation and Startup

> To ensure that IP addresses are not assigned more than once in the customer network, you must ping each new IP address to be configured before each IP address is assigned. If an IP address responds, then this address cannot be used again.

Table 7-1 HiPath 3800 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
Installing HiPath 3800 (19-Inch Cabinet)	
1.	Selecting the Installation Site, page 4-21 (generally determined by the existing 19-inch cabinet)
2.	Unpacking the Components, page 4-24
3.	Mounting System Cabinets in the 19-Inch Cabinet, page 4-25
4.	Grounding the System, page 4-28 Checking the Grounding, page 4-30
5.	Connecting the Cable to the Backplane, page 4-49
6.	If required: Inserting the External Patch Panel, Page 4-64
7.	Loading the System Software and Installing Subboards on the CBSAP, page 4-79
8.	Installing Boards (Configuration Notes), page 4-31 (cabinet(s) are already equipped with the boards) We recommend that you check the board population using the configuration notes.
9.	Making trunk connections Refer to the following board descriptions for information: ● STMD3 - for S_0 trunk connection ● DIUN2 - for S_{2M} trunk connection ● DIU2U (For U.S. Only) - for T1 PRI trunk

Table 7-1 HiPath 3800 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
10.	Making IP connections Perform the IP connection over the HG 1500 board STMI2. For information on startup and configuration, refer to the HG 1500 Administration Manual.
11.	Performing a Visual Inspection, page 4-81
Startup of HiPath 3800 (Section 5.2)	
1.	Supplying the System with Power, page 5-3 (Plugging in the system cabinet(s) -> starting system boot)
2.	Carrying Out a System Reload, page 5-6
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-7
4.	Not for U.S.: Entering the System Number, page 5-9
5.	Conducting customer-specific programming with HiPath 3000 Manager E. Refer to the HiPath 3000 Manager E Help for information on programming individual features.
6.	Performing a system check ● The following tests must be performed if telephones are directly connected to the gateway: – Check the telephones Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link. Perform random terminal tests as described in Section 12.3.1.8 on all telephones. – Check for proper system booting Set up internal and external calls at random to check if the system is functioning properly. ● Test IP configuration Ping the HG 1500 IP address in the gateway. Set up external calls at random (from optiPoints or optiClients on HiPath 5000).

7.4 Starting HiPath 3700 as a Gateway

7.4.1 Prerequisites

Warning
Only authorized service personnel should install and start up the system.

Refer to Section 4.3.1 for information on the tools and resources needed to install the HiPath 3700 system.

7.4.2 Procedure for Installation and Startup

To ensure that IP addresses are not assigned more than once in the customer network, you must ping each new IP address to be configured before each IP address is assigned. If an IP address responds, then this address cannot be used again.

Table 7-2 HiPath 3700 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
Installing HiPath 3700 (19-Inch Cabinet)	
1.	Selecting the Installation Site, page 4-128 (generally determined by the existing 19-inch cabinet)
2.	Unpacking the Components, page 4-128
3.	Mounting the System Cabinet in the 19-Inch Cabinet, page 4-129
4.	Mounting the Patch Panel in the 19-Inch Cabinet, page 4-133
5.	Grounding the System, page 4-134 Checking the Grounding, page 4-136
6.	Connecting the Cable to the Backplane, page 4-137
7.	Connecting the Line Network to the Patch Panel, page 4-150
8.	Loading the System Software and Installing Subboards on the CBCPR, page 4-151
9.	Configuration notes, page 4-152 (cabinet(s) are already equipped with the boards) We recommend that you check the board population using the configuration notes.
10.	Making trunk connections Refer to the following board descriptions for information: ● STMD8 - for S_0 trunk connection ● TMS2 (Not for U.S.) - for S_{2M} trunk connection ● TMST1 (for U.S. only) - for T1 PRI trunk

Table 7-2 HiPath 3700 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
11.	Making IP connections Perform the IP connection over the HG 1500 board HXGM3. For information on startup and configuration, refer to the HG 1500 Administration Manual.
12.	Performing a Visual Inspection, page 4-162
Startup of HiPath 3700 (Section 5.3)	
1.	Supplying the System with Power, page 5-12 (Plugging in the power supply unit -> starting system boot)
2.	Carrying Out a System Reload, page 5-15
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-15
4.	Not for U.S.: Entering the System Number, page 5-17
5.	Conducting customer-specific programming with HiPath 3000 Manager E. Refer to the HiPath 3000 Manager E Help for information on programming individual features.
6.	Performing a system check ● The following tests must be performed if telephones are directly connected to the gateway: – Check the telephones Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link. Perform random terminal tests as described in Section 12.3.1.8 on all telephones. – Check for proper system booting Set up internal and external calls at random to check if the system is functioning properly. ● Test IP configuration Ping the HG 1500 IP address in the gateway. Set up external calls at random (from optiPoints or optiClients on HiPath 5000).

7.5 Starting HiPath 3500 as a Gateway

7.5.1 Prerequisites

Warning
Only authorized service personnel should install and start up the system.

Refer to Section 4.4.1 for information on the tools and resources needed to install the HiPath 3500 system.

7.5.2 Procedure for Installation and Startup

To ensure that IP addresses are not assigned more than once in the customer network, you must ping each new IP address to be configured before each IP address is assigned. If an IP address responds, then this address cannot be used again.

Table 7-3 HiPath 3500 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
HiPath 3500 Installation (19-Inch Cabinet) (Section 4.4)	
1.	Selecting the Installation Site, page 4-187 (usually predetermined)
2.	Unpacking the Components, page 4-188
3.	Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall, page 4-189
4.	Installing a HiPath 3500 or HiPath 3300 in a Cabinet, page 4-190
5.	Grounding the System, page 4-192
6.	Connecting Cables and the Line Network, page 4-194
7.	Configuration notes, page 4-195
8.	Making trunk connections Refer to the following board descriptions for information: ● STLS4R - for S_0 trunk connection ● TS2R - for the S_{2M} trunk connection ● TST1 (for U.S. only) - for T1 PRI trunk Note: Analog workpoint clients can be connected to the CBRC’s T/R ports in emergencies. This ensures telephone operation via the telecommunications network in the event of IP network failure.

Table 7-3 HiPath 3500 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
9.	Making IP connections Perform the IP connection over the HG 1500 board HXGR3. For information on startup and configuration, refer to the HG 1500 Administration Manual.
10.	Performing a Visual Inspection, page 4-198
Startup of HiPath 3500 (Section 5.4)	
1.	Supplying the System With Power, page 5-20 (starting system boot).
2.	Carrying Out a System Reload, page 5-23
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-23
4.	Not for U.S.: Entering the System Number, page 5-25
5.	Conducting customer-specific programming with HiPath 3000 Manager E. Refer to the HiPath 3000 Manager E Help for information on programming individual features.
6.	Performing a system check ● The following tests must be performed if telephones are directly connected to the gateway: – Check the telephones Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link. Perform random terminal tests as described in Section 12.3.1.8 on all telephones. – Check for proper system booting Set up internal and external calls at random to check if the system is functioning properly. ● Test IP configuration Ping the HG 1500 IP address in the gateway. Set up external calls at random (from optiPoints or optiClients on HiPath 5000).

7.6 Starting HiPath 3300 as a Gateway

7.6.1 Prerequisites

⚠ **Warning**
Only authorized service personnel should install and start up the system.

Refer to Section 4.4.1 for information on the tools and resources needed to install the HiPath 3300 system.

7.6.2 Procedure for Installation and Startup

To ensure that IP addresses are not assigned more than once in the customer network, you must ping each new IP address to be configured before each IP address is assigned. If an IP address responds, then this address cannot be used again.

Table 7-4 HiPath 3300 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
HiPath 3300 Installation (19-Inch Cabinet) (Section 4.4)	
1.	Selecting the Installation Site, page 4-187 (usually predetermined)
2.	Unpacking the Components, page 4-188
3.	Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall, page 4-189
4.	Installing a HiPath 3500 or HiPath 3300 in a Cabinet, page 4-190
5.	Grounding the System, page 4-192
6.	Connecting Cables and the Line Network, page 4-194
7.	Configuration notes, page 4-195
8.	Making trunk connections Refer to the following board descriptions for information: ● STLS4R - for S_0 trunk connection Note: Analog workpoint clients can be connected to the CBRC's T/R ports in emergencies. This ensures telephone operation via the telecommunications network in the event of IP network failure.
9.	Making IP connections Perform the IP connection over the HG 1500 board HXGR3. For information on startup and configuration, refer to the HG 1500 Administration Manual.

Table 7-4 HiPath 3300 as a Gateway - Procedure for System Installation and Startup

Step	Activity (Remarks)
10.	Performing a Visual Inspection, page 4-198
Startup of HiPath 3300 (Section 5.4)	
1.	Supplying the System With Power, page 5-20 (starting system boot).
2.	Carrying Out a System Reload, page 5-23
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-23
4.	Not for U.S.: Entering the System Number, page 5-25
5.	Conducting customer-specific programming with HiPath 3000 Manager E. Refer to the HiPath 3000 Manager E Help for information on programming individual features.
6.	Performing a system check ● The following tests must be performed if telephones are directly connected to the gateway: – Check the telephones Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link. Perform random terminal tests as described in Section 12.3.1.8 on all telephones. – Check for proper system booting Set up internal and external calls at random to check if the system is functioning properly. ● Test IP configuration Ping the HG 1500 IP address in the gateway. Set up external calls at random (from optiPoints or optiClients on HiPath 5000).

8 Licensing

8.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Introduction, page 8-2
Licensing for HiPath 3000 V5.0, HiPath 5000 V5.0, page 8-4
● Products and Components subject to Mandatory Licensing, page 8-4
● Grace Period, page 8-6
● License Failure Period, page 8-6
● Performing Licensing, page 8-7
Licensing Scenarios, page 8-12
● HiPath 3000 as a Standalone System, page 8-12
● Networked HiPath 3000 Systems without HiPath 5000, page 8-13
● Networked HiPath 3000 Systems with HiPath 5000, page 8-14
● Upgrading to HiPath 3000 V5.0, HiPath 5000 V5.0, page 8-17
● Combining Standalone Systems (HiPath 3000) to Form a Network with HiPath 5000, page 8-20
● Removing a Standalone System from a Network with HiPath 5000, page 8-22
● Replacing License-sensitive Hardware (Changing the MAC Address), page 8-23
Licensing optiClient Attendant, page 8-26
● optiClient Attendant V7.0 Connected to HiPath 3000 V5.0, page 8-26
● optiClient Attendant V7.0 Connected to HiPath 3000 < V5.0, page 8-28
● Upgrading optiClient Attendant V6.0 –> V7.0 As Part of an Upgrade to HiPath 3000 V5.0., page 8-30
● Upgrade optiClient Attendant V6.0 –> V7.0 on HiPath 3000 < V5.0, page 8-32
● Changing Licenses on an optiClient Attendant V7.0 As Part of an Upgrade to HiPath 3000 V5.0, page 8-34
Protection Against License Manipulation, page 8-36

8.2 Introduction

Versions 5.0 and later of HiPath 3000 and HiPath 5000 use a new, centralized licensing procedure known as HiPath License Management. The procedure is used in all HiPath products, for example communication systems, workpoint clients, and applications.

To license a product you must first establish a connection with the Central License Server (CLS) via the Customer License Manager (CLM). The customer-specific data entered is used to uniquely identify the product configuration for which the relevant license file is to be supplied in encrypted format. The license file contains the licenses for all products which are subject to mandatory licensing.

The CLM is responsible for activating the license file and allocating it to the Customer License Agent (CLA). This is where the license data is validated. Distribution of the licenses to the individual products using HiPath 3000 Manager E can then begin.

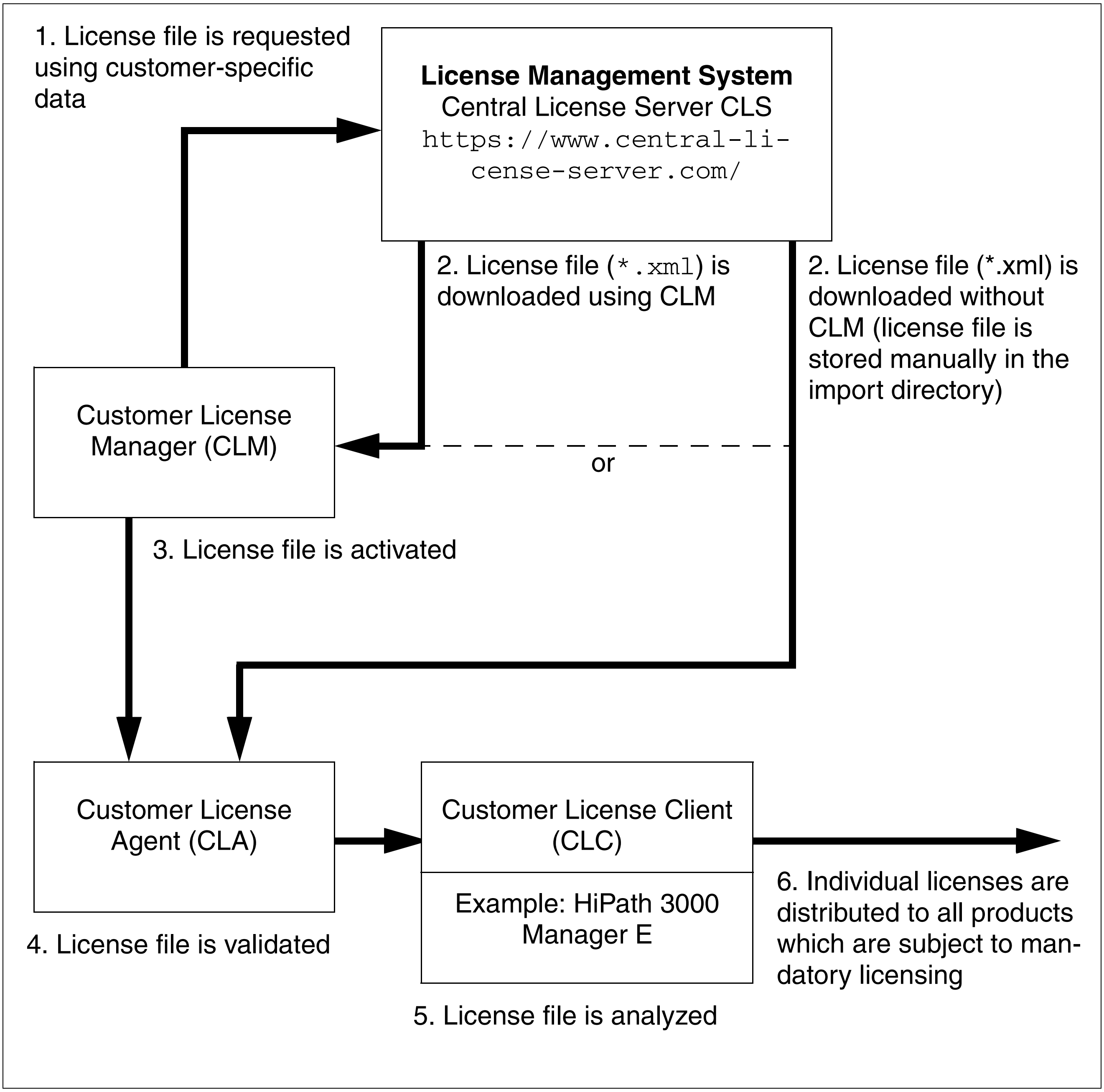

1. License file is requested using customer-specific data
License Management System
Central License Server CLS
https://www.central-license-server.com/
2. License file (*.xml) is downloaded using CLM
2. License file (*.xml) is downloaded without CLM (license file is stored manually in the import directory)
Customer License Manager (CLM)
or
3. License file is activated
Customer License Agent (CLA)
Customer License Client (CLC)
Example: HiPath 3000 Manager E
4. License file is validated
5. License file is analyzed
6. Individual licenses are distributed to all products which are subject to mandatory licensing

Figure 8-1 Licensing Process with Central License Server (CLS)

8.3 Licensing for HiPath 3000 V5.0, HiPath 5000 V5.0

8.3.1 Products and Components subject to Mandatory Licensing

The following products used with HiPath 3000 and HiPath 5000 V5.0 must be licensed (i.e. are subject to mandatory licensing). The required licenses are combined in a license file and must be distributed to the relevant products using HiPath 3000 Manager E.

Table 8-1 Features subject to mandatory licensing

Feature subject to mandatory licensing	**Details in license file**			**Default values in unlicensed state**		**Distribution of Licenses with HiPath 3000 Manager E**			
	Feature name	**Maximum number**	**Minimum number**	**During grace period**	**After grace period**	**Network-wide**	**Per board**	**Per port/per device**	**boards per system**
HG 1500 B channels	HG1500-B_Channels	2000	0	2000	2	–	58 per HG 1500 board	–	–
HiPath ComScendo licenses (e.g.optiClient 130 V5.0, optiPoint 410, NetMeeting)	HiPath ComScendo Licenses	2000	0	2000	0	–	HiPath 3000: 500 per Gatekeeper HiPath 5000: 1000 per Gatekeeper	–	–
IP security	IPSec	2000	0	2000	0	–	1 per HG 1500 board	–	–
CA functionality (Certification Authority)	CA functionality	1	0	1	0	–	Only on one HG 1500 board	–	–
Feature Server	DBFS	1	0	1	0	X	–	–	X
BS4 base station (HiPath Cordless Office)	BS4-B_Channels	6240 One license = one registration	0	6240	2 B channels per BS4	–	–	0 - 10 licenses per port	–

Table 8-1 Features subject to mandatory licensing

Feature subject to mandatory licensing	**Details in license file**			**Default values in unlicensed state**		**Distribution of Licenses with HiPath 3000 Manager E**			
	Feature name	**Maximum number**	**Minimum number**	**During grace period**	**After grace period**	**Network-wide**	**Per board**	**Per port/ per device**	**boards per system**
TS2 (S30810-Q2913-X300), TS2R (S30810-K2913-Z300)	S2M-B_Channels	8960	0	8960	2 per TS2/ TS2R	–	0 - 28 licenses per port	–	–
DIUN2 (S30810-Q2196-X)	S2M-B_Channels	8960	0	8960	2 licenses for port 1 0 licenses for port 2	–	0 - 28 licenses for port 1 0 - 30 licenses for port 2	–	–
IVM announcements	IVM Announcement	1024	0	1024	0	–	Max. 16 per IVM board	–	–
optiClient Attendant V7.0	optiClient Attendant V7.0	64	0	64	0	–	–	–	Max. 64 on a central board

The following features which are subject to mandatory licensing are licensed using separate license files:

- VPN Workpoint Clients
- CSTA Service Provider (CSP)
- TAPI Service Provider (TSP)
- HiPath Fault Management

Information on the licensing procedure can be found in the appropriate product documentation.

8.3.2 Grace Period

A product-specific Grace Period Configuration File (`<file name>.gpcf`) is installed with HiPath 3000 Manager E. If there is no valid license file (Real License File RLF) for the Customer License Agent CLA when the HiPath 3000 Manager E-license dialog is opened, the CLA automatically generates a grace period license file using the .gpcf file. The grace period licenses can be distributed in exactly the same way as RLF licenses. The only difference is that the validity period of the grace period license is limited to 30 days.

The .gpcf file ensures that the maximum expansion of all features that are subject to mandatory licensing is possible within the 30-day grace period. The system or systems are not licensed.

The.gpcf file must be stored in the HiPath 3000 Manager E installation directory.

The 30-day grace period begins with the licensing of a standalone system or networked systems using the .gpcf file. The licensing of all features, interfaces, and products that are subject to mandatory licensing must take place during this period.

The system falls into licensing default if licensing is not performed within the 30-day grace period. This means that features which subject to mandatory licensing will suffer from reduced functionality.

The activation of a grace period is recorded by the Customer License Agent (CLA) and in the system CDB. This ensures that the 30-day period cannot be extended and that a second grace period cannot be started.

8.3.3 License Failure Period

If a licensing error occurs, there is a period of 30 days (License Failure Period), within which the error must be rectified.

If the error has not been rectified by the time the 30-day license failure period has expired, the systems enter system default mode. This means that features which subject to mandatory licensing will suffer from reduced functionality.

8.3.4 Performing Licensing

> The details specified below are based on the assumption that valid license files are available to the user.

During installation of the Customer License Agent CLA on the service PC or on the HiPath 5000 server (see Figure 8-2), an `import` subdirectory is created in the installation directory.

If the user has received a valid license file (`<license>.xml`), there are two options:

- The license file can be stored manually in the specified subdirectory `import`.
- The Customer License Manager CLM can be activated and used to make the license file automatically available for the CLA. Information about this can be found in the Customer License Manager online help.

The license file in XML format contains information about all products that are subject to mandatory licensing and the MAC address with which these licenses are linked. Feature IDs define the number of licenses available and the length of time for which they are valid. A signature ensures that subsequent manipulation of the license file content is always detected. Invalid changes to the license file are therefore not possible.

Distribution of the licenses to the relevant features, interfaces, and products is performed using HiPath 3000 Manager E.

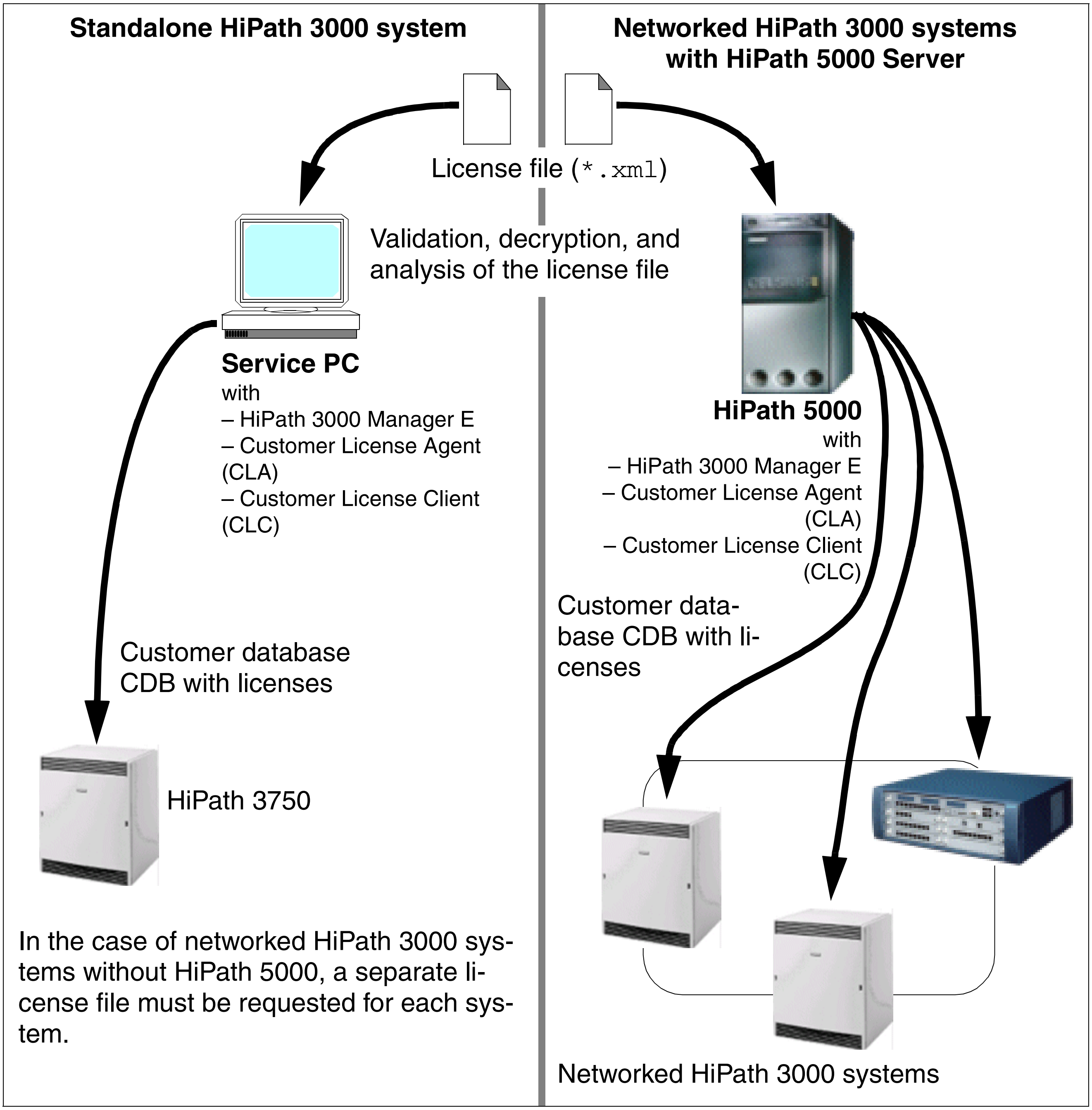

Standalone HiPath 3000 system
Networked HiPath 3000 systems with HiPath 5000 Server
License file (*.xml)
Validation, decryption, and analysis of the license file
Service PC
with
– HiPath 3000 Manager E
– Customer License Agent (CLA)
– Customer License Client (CLC)
HiPath 5000
with
– HiPath 3000 Manager E
– Customer License Agent (CLA)
– Customer License Client (CLC)
Customer database CDB with licenses
Customer database CDB with licenses
HiPath 3750
In the case of networked HiPath 3000 systems without HiPath 5000, a separate license file must be requested for each system.
Networked HiPath 3000 systems

Figure 8-2 Distribution of Licenses with HiPath 3000 Manager E

Procedure for distributing licenses

The license distribution procedure described below requires successful installation (see **Chapter 4, “Installing HiPath 3000”**) and startup (see **Chapter 5, “Starting Up HiPath 3000”**) of the HiPath 3000 systems (nodes) and, if available, of the HiPath 5000 server (see **Chapter 6, “HiPath 5000 Startup and Administration”**).

<table>
<tr><th rowspan="2">Step</th><th colspan="2">Activity (Remarks)</th></tr>
<tr><th>Standalone or networked HiPath 3000 systems without HiPath 5000</th><th>Networked HiPath 3000 systems with HiPath 5000</th></tr>
<tr><td>1.</td><td>Download and save the available CDB for the HiPath 3000 to be licensed using HiPath 3000 Manager E.</td><td>Download and save the available CDB for the HiPath 5000 server to be licensed using HiPath 3000 Manager E.</td></tr>
<tr><td rowspan="3">2.</td><td colspan="2">Open the "Licensing..." dialog in the "Settings" menu.
The Customer License Agent (CLA) installed on the PC opens the license file that corresponds to the MAC address.</td></tr>
<tr><td>● Licenses: The content of the license file is displayed.
In a configuration without HiPath 5000, these are the licenses for the open CDB and the corresponding node (HiPath 3000).</td><td>● Licenses: The content of the license file is displayed.
In a network with HiPath 5000, these are the licenses for the server CDB and all of the nodes (HiPath 3000) belonging to the network.
Note: When a single CDB is downloaded from a HiPath 3000/5000 network, only the license-sensitive CDB content is displayed. It is not possible to make any changes.</td></tr>
<tr><td colspan="2">– Feature: All features, interfaces, and products which are subject to mandatory licensing are displayed.
– Available: The number of licenses purchased for the feature in question is specified.
– Used: The number of licenses already assigned for the feature in question is specified. The number of available licenses not yet assigned is the difference between this number and the number specified under “Number”.
– Expiration date: If licenses are only available for a specific time, the date on which they expire is specified here.</td></tr>
</table>

<table>
<tr><th rowspan="2">Step</th><th colspan="2">Activity (Remarks)</th></tr>
<tr><th>Standalone or networked HiPath 3000 systems without HiPath 5000</th><th>Networked HiPath 3000 systems with HiPath 5000</th></tr>
<tr><td></td><td colspan="2">● CDB: The license-sensitive data for the open CDB is displayed. You can specify which data you want to display in the tabs "HXG" (HG 1500 boards HXGM3, HXGS3, HXGR3, STMI2), "S2M" (S_{2M} boards TS2, TS2R, DIUN2), "IVM" (HiPath Xpressions Compact boards IVML8, IVML24, IVMN8, IVMNL, IVMP8, IVMP8R, IVMS8, IVMS8R), "Base station" (HiPath Cordless Office base station BS4), and "System-wide" (the licenses assigned for the system-wide feature "DBFS" are displayed; no changes can be made.
– Type - Slot: The board type and the slot in which the board is inserted are displayed.
– Port: The board port used is displayed.
– Feature: The features, interfaces, and products which are subject to mandatory licensing are displayed.
– Assigned: The number of licenses assigned for this feature is specified.
– Base: The default value for each feature is displayed.
– Expiration date: The date displayed here specifies when the validity of the licenses assigned for this feature is due to expire.
For “Base station” tab only:
– Type - Slot - Port: The board type, the slot in which the board is inserted, and the board port used are displayed.
– BS Type: The base station type is displayed.
– Name: The name of the base station is displayed.
Note: If the right license is not available, only the license-sensitive CDB content is displayed. It is not possible to make any changes.</td></tr>
<tr><td>3.</td><td colspan="2">Distribute licenses.
You can select the features to be licensed (features, interfaces, and products) in the “HXG”, “S2M”, “IVM” and “Base station” tabs.
Distribute the licenses defined in the license file to the individual features.
Note that in a network with HiPath 5000, these are the licenses for all of the nodes (HiPath 3000) belonging to the network.
Note: The DBFS network-wide feature that may be included is automatically transferred to the CDB when the licensing dialog is started.</td></tr>
</table>

Step	Activity (Remarks)	
	Standalone or networked HiPath 3000 systems without HiPath 5000	**Networked HiPath 3000 systems with HiPath 5000**
4.	Save CDB and transfer to HiPath 3000.	Save CDB and transfer to HiPath 5000 server. The server transfers the CDB files to the networked systems autonomously. The HG 1500 boards are then registered automatically. Note: Unlike previous versions, this version does not require a reset of the HG 1500 boards. A reset should therefore not be carried out. as it may disrupt data transfer.

Note on licensing the Feature Server

The Feature Server can be started without a license. In this case a message indicating that licensing needs to be performed is displayed.

Given that the Feature Server receives its license from the CDB of the first node, the licensing dialog for this node must be opened first and, as a minimum requirement, licensing must be performed using a .gcpf file. The first node must then be added to the HiPath 3000/5000 network. The Feature Server now has its (grace period) license.

If the Feature Server is not licensed through the first node within one hour, the server automatically stops operating after an hour has elapsed. When the server is restarted there is a new one-hour period in which to perform licensing.

Preconfiguration can be performed in preparation for installation of a HiPath 3000/5000 network for a customer. Licensing is required for the network at the preconfiguration stage. If there is no valid license file available, licensing can also be performed using a GPCF file.

8.4 Licensing Scenarios

During production, the HiPath 3000 control boards are assigned a board-specific number with a MAC address that is unique worldwide. To guarantee unique licensing, the license file is linked to the MAC address of a HiPath 3000 control board. The various licensing scenarios are described below.

8.4.1 HiPath 3000 as a Standalone System

The components for this system which require licensing are licensed using one license file. This file is linked with the MAC address of the HiPath 3000 control board.

Procedure

Step	Activity (Remarks)
1.	**HiPath 3000 Manager E (In cases where the MAC address is not already available):**
	Determine the MAC address of the control board of the HiPath 3000 system requiring licensing.
2.	**HiPath License Management:**
	Invoke the Central License Server (CLS) via `https://www.central-license-server.com/` Select the language version for the License Management Center. Log on by entering the user name and password.
3.	Activate the "Generate and Download License Key" function under "Management of Available Licenses". Various search criteria is displayed for activating the available licenses.
4.	In the "LAC" input field, enter the part number and the packing slip number (separated by a dash). Click *Search* to display a list of the features which are subject to mandatory licensing and for which licenses are available.
5.	From this list, select the features which are subject to mandatory licensing and which you want to generate a license. Activate the *Generate Key* button. In the subsequent dialog, define the number of licenses to be generated and specify the MAC address to which the license should be linked.

Step	Activity (Remarks)
6.	In the "MAC Address" input field, enter the MAC address for the HiPath 3000 control board as specified in step 1. In the "Number" field, define the number of licenses to be generated for each feature. Click *Next*.
7.	The customer and the user (contact partner) specified for this transaction are displayed. If there are still no entries available, these can be selected using the search mask for companies and the search mask for users. Click *Next*.
8.	Before generating a license key, the following content of the displayed dialog must be observed: ● Legal notice: The licensing conditions must be accepted. ● Notes: Notes on the generation procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). ● Registered company and user: Company and user-specific data is displayed. ● Technical specifications: MAC address of the HiPath 3000 control board. ● Licenses to be used: The outcome of the generation procedure is displayed. Click the *Execute* button. A new license key is generated.
9.	After successful execution, the message "License Key Generation Complete" appears The generation information and license key data is displayed. Click *License Key*.
10.	Details on the selected license key are displayed: ● “View” tab: Type and number of licensed features, customer-specific information. ● “Transactions” tab: Actions performed for each feature
11.	Click the *Save License Key* button. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.3.4 describes the procedure for distributing licenses with HiPath 3000 Manager E.

8.4.2 Networked HiPath 3000 Systems without HiPath 5000

Licensing of the components which are subject to mandatory licensing is performed on a system-wide basis. This means that a separate license file must be requested for each system. This file is linked with the MAC address of the control board belonging to the relevant system.

The procedure for generating the various license keys is the same as that in Section 8.4.1.

8.4.3 Networked HiPath 3000 Systems with HiPath 5000

Licensing of the components which are subject to mandatory licensing is performed on a network-wide basis. This means that a single license file is required for the entire HiPath 3000/5000 network. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).

> When a single CDB is downloaded from a HiPath 3000/5000 network, only the license-sensitive CDB content is displayed. It is not possible to make any changes.

A cyclic check carried out every 24 hours guarantees continuous protection against manipulation. Each node belonging to the network sends a request to the Feature Server to verify whether the license is still valid. The time at which the daily check takes place depends on the time at which licensing takes place. The time of the daily check is redefined with each system reset.

Example: Licensing takes place at 5:00 p.m. Based on the 24-hour cycle, this means that the licensing check begins at 5:00 p.m. every day.
A system reset is performed at 10:00 p.m. The time of the daily check is redefined as a result. The licensing check begins at 10:00 p.m. every day with immediate effect.
Each additional reset results in the time of the daily check being redefined.

The system distinguishes between the following two types of error:

- The Feature Server is unable to reach the first node needed for licensing. The 30-day License Failure Period begins.
- A standalone HiPath 3000 system (node) is unable to reach the Feature Server. The 30-day License Failure Period begins.

If the error is rectified within 30 days, the system(s) revert(s) to the licensed state. If the error has not been rectified by the time the 30-day license failure period has expired, the systems enter system default mode. This means that features which subject to mandatory licensing will suffer from reduced functionality.

Procedure

Step	Activity (Remarks)
1.	**HiPath 3000 Manager E (In cases where the MAC address is not already available):**
	The MAC address of the HiPath 3000 system control board with the lowest node number (node ID) should be determined.

Step	Activity (Remarks)
2.	**HiPath License Management:**
	Invoke the Central License Server (CLS) via `https://www.central-license-server.com/` Select the language version for the License Management Center. Log on by entering the user name and password.
3.	Activate the "Generate and Download License Key" function under "Management of Available Licenses". Various search criteria is displayed for activating the available licenses.
4.	In the "LAC" input field, enter the part number and the packing slip number (separated by a dash). Click *Search* to display a list of the features which are subject to mandatory licensing and for which licenses are available.
5.	From this list, select the features which are subject to mandatory licensing and which you want to generate a license. Activate the *Generate Key* button. In the subsequent dialog, define the number of licenses to be generated and specify the MAC address to which the license should be linked.
6.	In the "MAC Address" input field, enter the MAC address for the HiPath 3000 control board as specified in step 1. In the "Number" field, define the number of licenses to be generated for each feature. Click *Next*.
7.	The customer and the user (contact partner) specified for this transaction are displayed. If there are still no entries available, these can be selected using the search mask for companies and the search mask for users. Click *Next*.
8.	Before generating a license key, the following content of the displayed dialog must be observed: ● Legal notice: The licensing conditions must be accepted. ● Notes: Notes on the generation procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). ● Registered company and user: Company and user-specific data is displayed. ● Technical specifications: MAC address of the HiPath 3000 control board. ● Licenses to be used: The outcome of the generation procedure is displayed. Click the *Execute* button. A new license key is generated.
9.	After successful execution, the message "License Key Generation Complete" appears The generation information and license key data is displayed. Click *License Key*.

Step	Activity (Remarks)
10.	Details on the selected license key are displayed: ● "View" tab: Type and number of licensed features, customer-specific information. ● "Transactions" tab: Actions performed for each feature
11.	Click the *Save License Key* button. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.3.4 describes the procedure for distributing licenses with HiPath 3000 Manager E.

8.4.4 Upgrading to HiPath 3000 V5.0, HiPath 5000 V5.0

To upgrade from a version earlier than 5.0 to HiPath 3000 V5.0 or HiPath 5000 V5.0, you must request a new license file and repeat the licensing procedure.

The Central License Server (CLS) enables the old licenses (< V5.0) to be converted into new licenses that are valid for version 5.0.

The following features that are subject to mandatory licensing are converted:

- HG 1500 B channels (previous designation: max. no. of B channels)
- HiPath ComScendo licenses (previous designation: max. no. of workpoint clients)
- IP Sec
- CA functionality
- Feature Server (previous designation: HiPath 5000 RSM)

Features that were not previously subject to mandatory licensing cannot be migrated. The base station BS4 is a new product. DIUN2 (S30810-Q2196-X), TS2 (S30810-Q2913-X300) and TS2R (S30810-K2913-Z300) are new boards. Up to now, no license was required for the IVM announcement feature. These features are released with the maximum configuration following an upgrade.

- BS4 (number of B channels per BS4)
- DIUN2, TS2, TS2R (number of B channels per port)
- IVM announcements (IVM boards, number of B channels per port)

Procedure

Step	Activity (Remarks)
1.	**Web-based Management (WBM) (in the event that the MAC addresses are not already available):**
	Determine the MAC addresses (locking IDs) of all HG 1500 boards belonging to the HiPath 3000 system to be upgraded. If this involves the networking of several HiPath 3000 systems, then the MAC addresses (locking IDs) of all available HG 1500 boards are to be determined.

<table>
<tr><th>Step</th><th colspan="2">Activity (Remarks)</th></tr>
<tr><td rowspan="2">2.</td><td colspan="2">HiPath 3000 Manager E (In cases where the MAC addresses are not already available.):</td></tr>
<tr><td>A single HiPath 3000 system or several networked HiPath 3000 systems must be upgraded without HiPath 5000:
The MAC address of the associated control board should be determined for every system.</td><td>Upgrading involves several networked HiPath 3000 systems with HiPath 5000:
The MAC address of the control board is to be determined solely for the HiPath 3000 system with the lowest node number (node ID).</td></tr>
<tr><td rowspan="2">3.</td><td colspan="2">HiPath License Management:</td></tr>
<tr><td colspan="2">Invoke the Central License Server (CLS) via <code>https://www.central-license-server.com/</code>
Select the language version for the License Management Center.
Log on by entering the user name and password.</td></tr>
<tr><td>4.</td><td colspan="2">Activate the "View Used Licenses and Certificates and License Key" function under "Management of Used Licenses".
Different search criteria are displayed in order to invoke the licenses to be converted (B channels of HG 1500 boards.</td></tr>
<tr><td>5.</td><td colspan="2">The MAC address (locking ID) of a HG 1500 board determined under step 1 should be entered in the Locking ID input field.
Click the <i>Search</i> button to display a list of the licenses belonging to the MAC address (locking ID).</td></tr>
<tr><td>6.</td><td colspan="2">Click the <i>Show Details</i> button.
Details on the selected license key are displayed:
● “View” tab: Type and number of licensed features, customer-specific information.
● “Transactions” tab: Actions performed for each feature</td></tr>
<tr><td>7.</td><td colspan="2">Click the <i>Upgrade</i> button.
In the subsequent dialog, define the MAC address to which the new license should be linked.</td></tr>
<tr><td>8.</td><td colspan="2">The MAC address of the HiPath 3000 control board to which the HG 1500 board specified under step 5 belongs should be entered in the MAC Address input field.
Click <i>Next</i>.</td></tr>
</table>

<table>
<tr><th>Step</th><th colspan="2">Activity (Remarks)</th></tr>
<tr><td>9.</td><td colspan="2">Before upgrading a license key, the following content of the displayed dialog must be observed:
● Legal notice: The licensing conditions must be accepted.
● Notes: Notes on this procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible).
● Registered company and user: Company and user-specific data is displayed.
● Upgrade details: MAC address of the HiPath 3000 control board.
● Licenses to be used: The outcome of this procedure is displayed.
Example:
HiPath HG 1500 V2 & V3:
– 6 features (Licenses) will be upgraded as a result of this transaction.
– 6 features (Licenses) will be disabled as a result of this transaction.
This means that all six available licenses have been linked with the new MAC address. The old link with the HG 1500 board MAC address (Locking ID) was disabled for all six licenses.
Click the *Execute* button. The license key is upgraded.</td></tr>
<tr><td>10.</td><td colspan="2">After successful execution, the message "License Key Generation Complete" appears The upgrade information and the information about the license key will be displayed.
Note: The number of pre-installed HG 1500-B channels is no longer displayed, nut only the effective total for the released licenses.</td></tr>
<tr><td>11.</td><td>Upgrading involves either a single HiPath 3000 system or several networked systems without HiPath 5000:
Steps 4 to 10 must be repeated for all available HG 1500 boards.
Note: The new licensing applies on a system-by-system basis. A separate license key is generated for each HiPath 3000 system.</td><td>Upgrading involves several networked HiPath 3000 systems with HiPath 5000:
Steps to 4 must be repeated for all available HG101500 boards.
Note: New licenses apply to the entire network. In other words, a single license key is generated for the entire HiPath 3000/5000 network. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).</td></tr>
<tr><td>12.</td><td colspan="2">Invoke the License Management Center homepage.</td></tr>
<tr><td>13.</td><td colspan="2">Activate the "View Used Licenses and Certificates and License Key" function under "Management of Used Licenses".
Various search criteria are displayed for calling the recently upgraded license key.</td></tr>
<tr><td>14.</td><td colspan="2">In the "Locking ID" input field, enter the control board MAC address to which the license key is linked (see step 6).
Click the *Search* button to display a list of the license keys belonging to the MAC address.</td></tr>
</table>

Step	Activity (Remarks)
15.	Select the relevant license key and click the *Display Details* button. Details on the selected license key are displayed: ● "View" tab: Type and number of licensed features, customer-specific information. ● "Transactions" tab: Actions performed for each feature
16.	Click the *Save License Key* button. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.3.4 describes the procedure for distributing licenses with HiPath 3000 Manager E.

8.4.5 Combining Standalone Systems (HiPath 3000) to Form a Network with HiPath 5000

Only one license file is required if combining multiple standalone systems to create a network with HiPath 5000.

The "Rehost" function of the Central License Servers (CLS) enables the various license files to be converted into a new, network-wide overall license file. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).

Procedure

Step	Activity (Remarks)
1.	**HiPath 3000 Manager E (In cases where the MAC addresses are not already available.):**
	The MAC address of the associated control board should be determined for every HiPath 3000 system. The new network-wide overall license file is linked to the MAC address of the HiPath 3000 system with the lowest node number (node ID).
2.	**HiPath License Management:**
	Invoke the Central License Server (CLS) via `https://www.central-license-server.com/` Select the language version for the License Management Center. Log on by entering the user name and password.
3.	Call the "Rehost Licenses" function under "Management of Used Licenses". Different search criteria are displayed in order to call up the licenses to be converted.

Step	Activity (Remarks)
4.	The MAC address of a HiPath 3000 control board determined under step 1 should be entered in the Locking ID input field. After the *Find* button is selected, the licenses belonging to the MAC address are displayed.
5.	Activate the *Rehost* button. In the subsequent dialog, define the MAC address to which the new license should be linked.
6.	The MAC address of the control board whose HiPath 3000 system has the lowest node number (node ID) should be entered in the MAC address input field. Click *Next*.
7.	Before you start to generate a new license key, note the following content of the mask displayed: ● Legal notice: The licensing conditions must be accepted. ● Notes: Notes on this procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). ● Registered company and user: Company and user-specific data is displayed. ● Rehost details: MAC address of the HiPath 3000 control board. ● Licenses to be used: The outcome of this procedure is displayed. Example: HG 1500 V2 & V3: – 6 features (Licenses) will be upgraded as a result of this transaction. – 6 features (Licenses) will be disabled as a result of this transaction. This means that all six available licenses have been linked with the new MAC address. The old link with the HG 1500 board MAC address (Locking ID) was disabled for all six licenses. Click the *Execute* button. A new license key is generated.
8.	After successful execution, the message "License Key Generation Complete" appears The generation information and license key data is displayed.
9.	Steps 4 to 8 should be repeated for all HiPath 3000 systems. Note: New licenses apply to the entire network. In other words, a single license key is generated for the entire HiPath 3000/5000 network. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).
10.	Invoke the License Management Center homepage.
11.	Activate the "View Used Licenses and Certificates and License Key" function under "Management of Used Licenses". Various search criteria are displayed for invoking the generated license key.

Step	Activity (Remarks)
12.	In the "Locking ID" input field, enter the control board MAC address to which the license key is linked (see step 6). Click the *Search* button to display a list of the license keys belonging to the MAC address.
13.	Select the relevant license key and click the *Display Details* button. Details on the selected license key are displayed: ● "View" tab: Type and number of licensed features, customer-specific information. ● "Transactions" tab: Actions performed for each feature
14.	Click the *Save License Key* button. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.3.4 describes the procedure for distributing licenses with HiPath 3000 Manager E.

8.4.6 Removing a Standalone System from a Network with HiPath 5000

If a standalone node (HiPath 3000) is to be removed from a network with HiPath 5000, a new license file is required for the standalone system. A new, network-wide general license file must also be requested for the rest of the network.

The "Rehost" function of the Central License Server (CLS) enables the old general license file to be converted into a new single license file (for the standalone system) and a new general license file (for the remaining network).

8.4.7 Replacing License-sensitive Hardware (Changing the MAC Address)

A new license file is always required if you replace a license-sensitive HiPath 3000 control board due to a hardware defect. In this case, the MAC address changes and the license becomes invalid.

The "Rehost" function of the Central License Server (CLS) enables the licenses to be moved from the old MAC address (the old HiPath 3000 control board to be replaced) to a new MAC address (a new HiPath 3000 control board).

Procedure

Step	Activity (Remarks)
1.	**HiPath License Management:**
	Invoke the Central License Server (CLS) via `https://www.central-license-server.com/` Select the language version for the License Management Center. Log on by entering the user name and password.
2.	Call the "Rehost Licenses" function under "Management of Used Licenses". Different search criteria are displayed in order to call up the licenses to be converted.
3.	Enter the MAC address of the HiPath 3000 control board to be replaced (defective) in the Locking ID input field. After the *Find* button is selected, the licenses belonging to the MAC address are displayed.
4.	Activate the *Rehost* button. In the subsequent dialog, define the MAC address to which the new license should be linked.
5.	In the "MAC Address" input field, enter the MAC address for the new control board. Click *Next*.

Step	Activity (Remarks)
6.	Before you start to generate a new license key, note the following content of the mask displayed: ● Legal notice: The licensing conditions must be accepted. ● Notes: Notes on this procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). ● Registered company and user: Company and user-specific data is displayed. ● Rehost details: MAC address of the HiPath 3000 control board. ● Licenses to be used: The outcome of this procedure is displayed. Example: HG 1500 V2 & V3: – 6 features (Licenses) will be upgraded as a result of this transaction. – 6 features (Licenses) will be disabled as a result of this transaction. This means that all six available licenses have been linked with the new MAC address. The old link to the MAC address of the defective HiPath 3000 control board has been deactivated for all six licenses. Click the *Execute* button. A new license key is generated.
7.	After successful execution, the message "License Key Generation Complete" appears The generation information and license key data is displayed.
8.	Invoke the License Management Center homepage.
9.	Activate the "View Used Licenses and Certificates and License Key" function under "Management of Used Licenses". Various search criteria are displayed for invoking the generated license key.
10.	In the "Locking ID" input field, enter the control board MAC address to which the license key is linked (see step 5). Click the *Search* button to display a list of the license keys belonging to the MAC address.
11.	Select the relevant license key and click the *Display Details* button. Details on the selected license key are displayed: ● “View” tab: Type and number of licensed features, customer-specific information. ● “Transactions” tab: Actions performed for each feature
12.	Click the *Save License Key* button. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.3.4 describes the procedure for distributing licenses with HiPath 3000 Manager E.

Note on Replacing the HiPath 3000 Control Board:
When the control board has been successfully replaced, the CDB must be transferred to HiPath 3000. A warning will appear that the MAC address is invalid. All licenses become invalid if the CDB is installed. The system goes into default and features that are subject to mandatory licensing will suffer from reduced functionality. The new license key (see step 12) must be used to achieve valid licensing.
Section 8.3.4 describes the procedure for distributing licenses with HiPath 3000 Manager E.

8.5 Licensing optiClient Attendant

In optiClient Attendant V7.0 or later, licensing is performed via HiPath License Management. In the case of versions < 7.0, licensing is performed on the optiClient Attendant as before.

optiClient Attendant V7.0 licensing is performed both for new installations and upgrades.

If you order an upgrade, a valid optiClient Attendant V6.0 CD key is a strict licensing requirement.

Upgrades are not available for versions previous to optiClient Attendant V6.0.

8.5.1 optiClient Attendant V7.0 Connected to HiPath 3000 V5.0

Licensing is performed on the associated HiPath 3000 system. In order to ensure unique licensing, the license file is linked with the MAC address of the HiPath 3000 control board.

Procedure

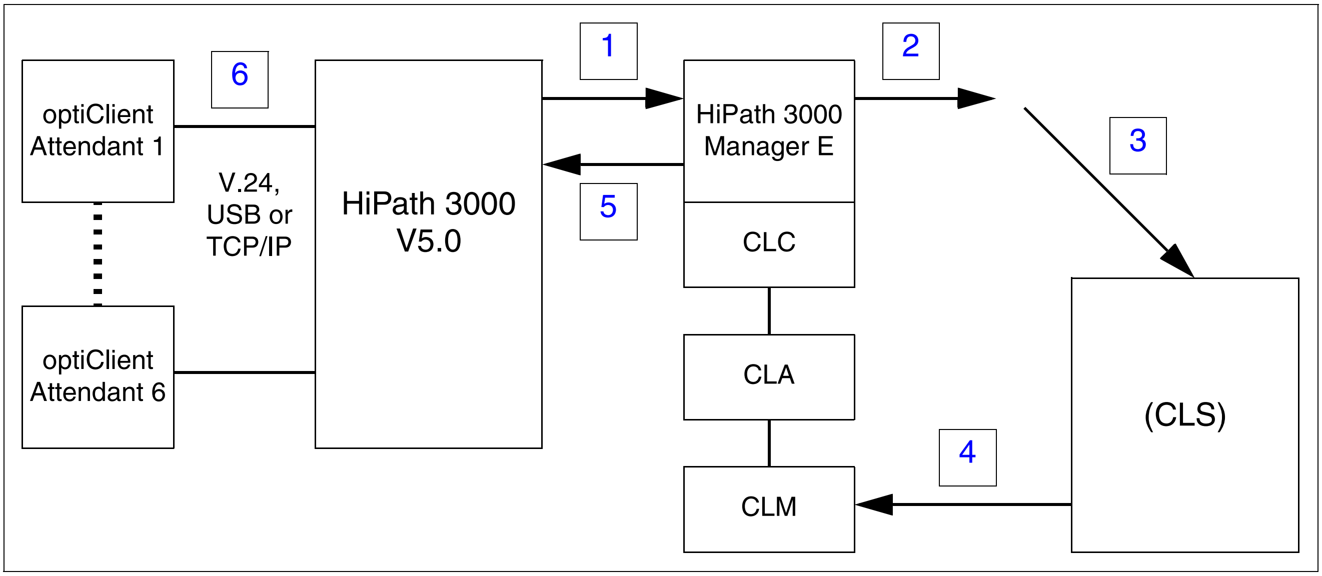

optiClient Attendant 1
6
V.24, USB or TCP/IP
optiClient Attendant 6
HiPath 3000 V5.0
1
5
HiPath 3000 Manager E
CLC
CLA
CLM
2
3
4
(CLS)

Figure 8-3 Procedure for Licensing optiClient Attendant V7.0 on HiPath 3000 V5.0

Step	Activity (Remarks)
1.	Read the customer data record of the HiPath 3000 V5.0.
2.	Read out the MAC address of the HiPath 3000 control board.

Step	Activity (Remarks)
3.	Enter the LAC and MAC address at the CLS in order to generate the license key either ● a) via CLM/CLS communication, or ● b) via direct communication with the CLS via a web browser.
4.	Transfer the license key from the CLS via the CLM to the CLA (CLC - HiPath 3000 Manager E). ● a) via CLM/CLS communication, or ● b) manually on the CLM (license key is already available, offline activation).
5.	Write the CDR to HiPath 3000 V5.0. (Once the license data has been transferred to HiPath 3000, the CLA is no longer required.).
6.	Install optiClient Attendant(s). “Any” number of optiClient Attendants can be installed. However, HiPath 3000 monitors the number of licensedoptiClient Attendants as part of the logon procedure. Depending on the model, up to six optiClient Attendants can be started per system. When the HiPath 3000 is started for the first time, a 30-day grace period begins. During this time, all HiPath 3000 features that require licensing (including optiClient Attendant) can be operated without a license. All features that require a license (including optiClient Attendants that have been subsequently installed) must be licensed before the grace period of the HiPath 3000 expires. The 30-day limit cannot be extended and a second grace period will not be granted. In this case, the CLS generates a license key for HiPath 3000 V5.0. Note: For CLS, an optiClient Attendant V7.0 is generally specified as a “HiPath 3000/ 5000 V5.0 product” and “HiPath 3000 optiClient Attendant V7.0 feature”.

8.5.2 optiClient Attendant V7.0 Connected to HiPath 3000 < V5.0

Licensing is performed on the optiClient Attendant. In order to ensure unique licensing, the license file is linked with the MAC address of the CLA PC.

Procedure

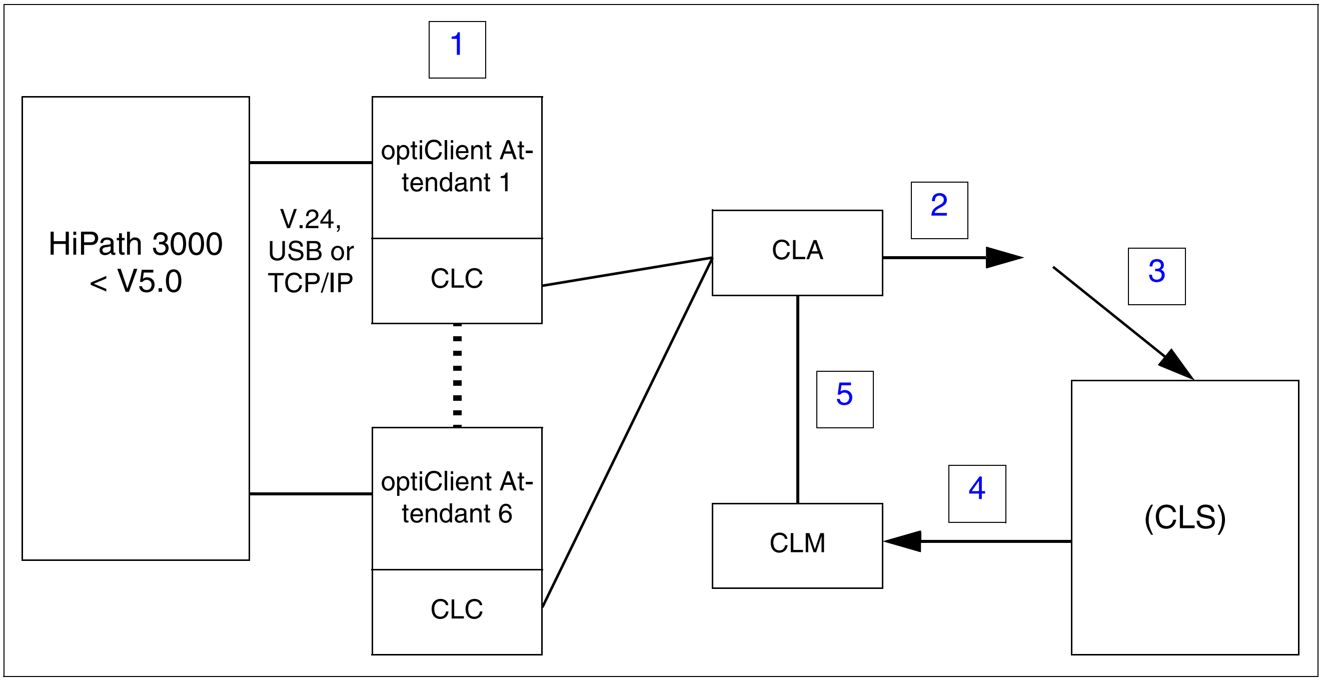


Figure 8-4 Procedure for Licensing optiClient Attendant V7.0 on HiPath 3000 < V5.0

Step	Activity (Remarks)
1.	Install optiClient Attendant and CLA (if not yet available). Enter the IP address and port number of the CLA in the optiClient Attendant configuration manager.
2.	Read out the MAC address of the CLA PC (via the CLM).
3.	Enter the LAC and MAC address at the CLS in order to generate the license key either ● a) via CLM/CLS communication, or ● b) via direct communication with the CLS via a web browser.
4.	Transfer the license key from the CLS via the CLM to the CLA either ● a) via CLM/CLS communication, or ● b) manually on the CLM (license key is already available, offline activation).

Step	Activity (Remarks)
5.	Once the license data has been transferred to the CLA, the optiClient Attendant can start. Licensing is controlled by the CLA. For this reason, communication between the optiClient Attendant and CLA must be ensured during active operation. If the connection to the CLA is lost or the CLA breaks down, an error message is output at the optiClient Attendant. At this point, the optiClient Attendant is still operational. If the optiClient Attendant cannot locate a CLA at startup, the optiClient Attendant will not boot. “Any” number of optiClient Attendants can be installed. However, the CLA monitors the number of licensed optiClient Attendants as part of the logon procedure and during operation. Depending on the model, up to six optiClient Attendants can be started per system. When the optiClient Attendant is started for the first time, a 30-day grace period begins. During this time, a optiClient Attendant can be operated without a license. All optiClient Attendants (including those that have been subsequently installed) must be licensed before the grace period expires for the first optiClient Attendant installed. The 30-day limit cannot be extended and a second grace period will not be granted. In this case, the CLS generates a license key for the CLA PC, and not for HiPath 3000. Note: For CLS, an optiClient Attendant V7.0 is generally specified as a “HiPath 3000/ 5000 V5.0 product” and “HiPath 3000 optiClient Attendant V7.0 feature”.

8.5.3 Upgrading optiClient Attendant V6.0 –> V7.0 As Part of an Upgrade to HiPath 3000 V5.0.

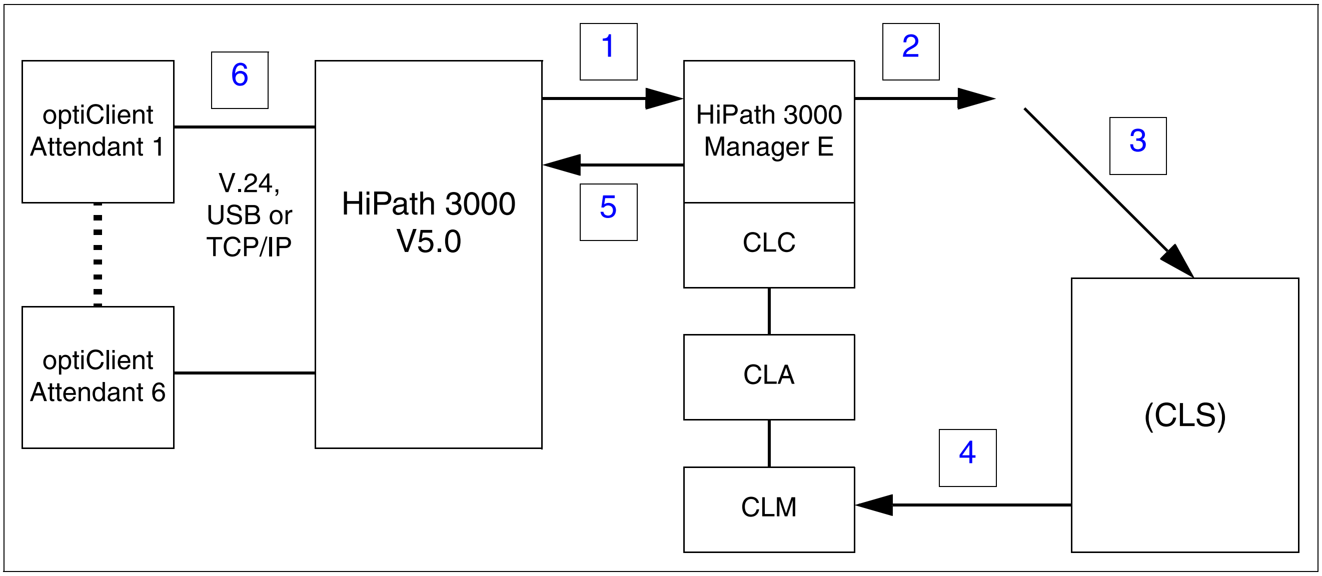
As part of the upgrade to HiPath 3000 V5.0, the licensing procedure for optiClient Attendant changes:

HiPath 3000 < V5.0		HiPath 3000 V5.0
Licensing is performed on the optiClient Attendant.	–>	Licensing is performed on the associated HiPath 3000 system.

In order to ensure unique licensing, the new license file is linked with the MAC address of the HiPath 3000 control board.

Procedure

> The procedure described below assumes that the HiPath 3000 upgrade to V5.0 has already been completed.



optiClient Attendant 1
optiClient Attendant 6
6
V.24, USB or TCP/IP
HiPath 3000 V5.0
1
5
HiPath 3000 Manager E
CLC
CLA
CLM
2
3
4
(CLS)

Figure 8-5 Licensing procedure when upgrading optiClient Attendant V6.0 –> V7.0 on HiPath 3000 V5.0

Step	Activity (Remarks)
1.	Read the customer data record of the HiPath 3000 V5.0.
2.	Read out the MAC address of the HiPath 3000 control board.

Step	Activity (Remarks)
3.	Enter the LAC and MAC address and the CD key of the optiClient Attendant V6.0 at the CLS in order to generate the license key. Input is only possible directly via the CLS (direct communication with the CLS via web browser).
4.	Transfer the license key or save it to the buffer memory. This is completed by manually entering the license to the CLA (performed on the CLM, offline activation).
5.	Write the customer data record to HiPath 3000 V5.0.
6.	optiClient AttendantInstall (s). “Any” number of optiClient Attendants can be installed. However, HiPath 3000 monitors the number of licensedoptiClient Attendants as part of the logon procedure. Depending on the model, up to six optiClient Attendants can be started per system. When the HiPath 3000 is started for the first time, a 30-day grace period begins. During this time, all HiPath 3000 features that require licensing (including optiClient Attendant) can be operated without a license. All features that require a license (including HiPath 3000s that have been subsequently installed) must be licensed before the grace period of the optiClient Attendant expires. The 30-day limit cannot be extended and a second grace period will not be granted. In this case, the CLS generates a license key for HiPath 3000 V5.0. Note: For CLS, an optiClient Attendant V7.0 is generally specified as a “HiPath 3000/5000 V5.0 product” and “HiPath 3000 optiClient Attendant V7.0 feature”.

8.5.4 Upgrade optiClient Attendant V6.0 –> V7.0 on HiPath 3000 < V5.0

As part of the optiClient Attendant upgrade, licensing is also upgraded from V6.0 to V7.0. In order to ensure unique licensing, the new license file is linked with the MAC address of the CLA PC.

Procedure

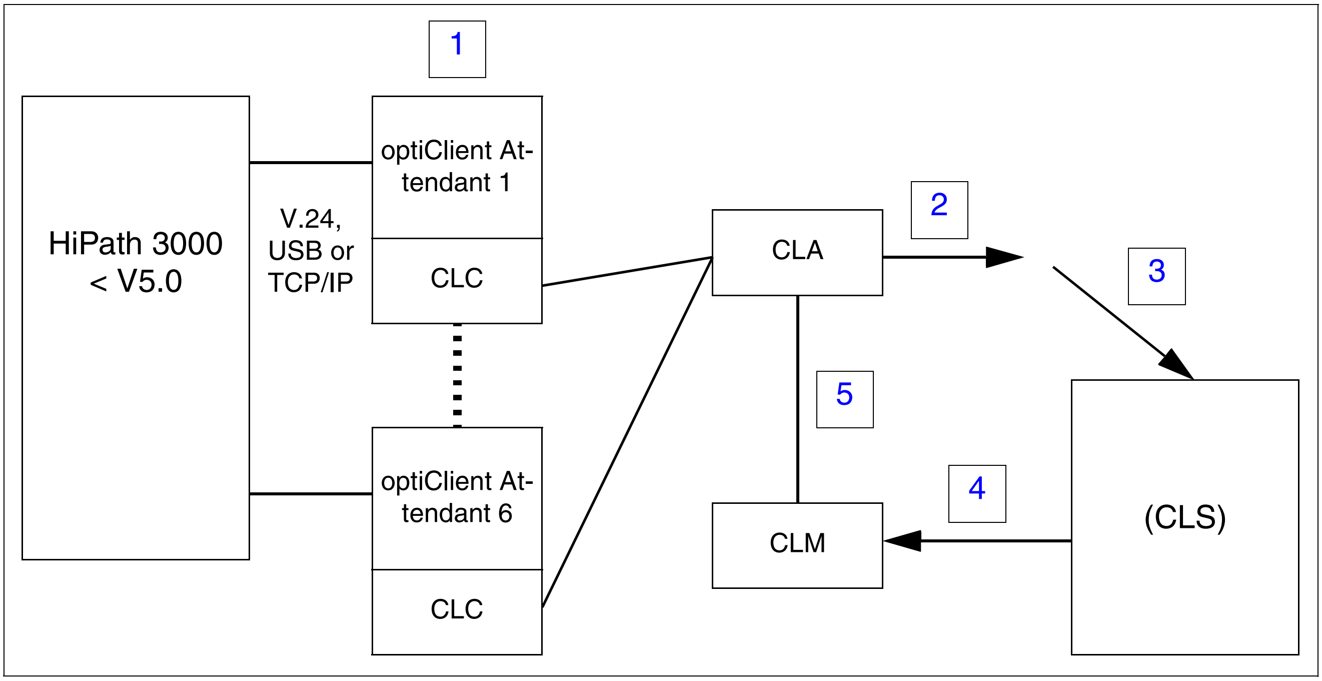

1
HiPath 3000 < V5.0
V.24, USB or TCP/IP
optiClient Attendant 1
CLC
optiClient Attendant 6
CLC
CLA
2
3
5
4
CLM
(CLS)

Figure 8-6 Procedure for Licensing when Upgrading optiClient Attendant V6.0 –> V7.0 on HiPath 3000 < V5.0

Step	Activity (Remarks)
1.	Install optiClient Attendant and CLA (if not yet available). Enter the IP address and port number of the CLA in the optiClient Attendant configuration manager.
2.	Read out the MAC address of the CLA PC (via the CLM).
3.	Enter the LAC and MAC address and the CD key of the optiClient Attendant V6.0 at the CLS in order to generate the license key. Input is only possible directly via the CLS (direct communication with the CLS via web browser).

Step	Activity (Remarks)
4.	Transfer the license key from the CLS via the CLM to the CLA either - a) via CLM/CLS communication, or - b) manually on the CLM (license key is already available, offline activation).
5.	Once the license data has been transferred to the CLA, the optiClient Attendant can start. Licensing is controlled by the CLA. For this reason, communication between the optiClient Attendant and CLA must be ensured during active operation. If the connection to the CLA is lost or the CLA breaks down, an error message is output at the optiClient Attendant. At this point, the optiClient Attendant is still operational. If the optiClient Attendant cannot locate a CLA at startup, the optiClient Attendant will not boot. “Any” number of optiClient Attendants can be installed. However, the CLA monitors the number of licensed optiClient Attendants as part of the logon procedure and during operation. Depending on the model, up to six optiClient Attendants can be started per system. When the optiClient Attendant is started for the first time, a 30-day grace period begins. During this time, a optiClient Attendant can be operated without a license. All optiClient Attendants (including those that have been subsequently installed) must be licensed before the grace period expires for the first optiClient Attendant installed. The 30-day limit cannot be extended and a second grace period will not be granted. In this case, the CLS generates a license key for the CLA PC, and not for HiPath 3000. Note: For CLS, an optiClient Attendant V7.0 is generally specified as a “HiPath 3000/5000 V5.0 product” and “HiPath 3000 optiClient Attendant V7.0 feature”.

8.5.5 Changing Licenses on an optiClient Attendant V7.0 As Part of an Upgrade to HiPath 3000 V5.0

As part of the upgrade to HiPath 3000 V5.0, the licensing procedure for optiClient Attendant changes:

HiPath 3000 < V5.0		HiPath 3000 V5.0
Licensing is performed on the optiClient Attendant.	–>	Licensing is performed on the associated HiPath 3000 system.

In order to ensure unique licensing, the new license file is linked with the MAC address of the HiPath 3000 control board.

Procedure

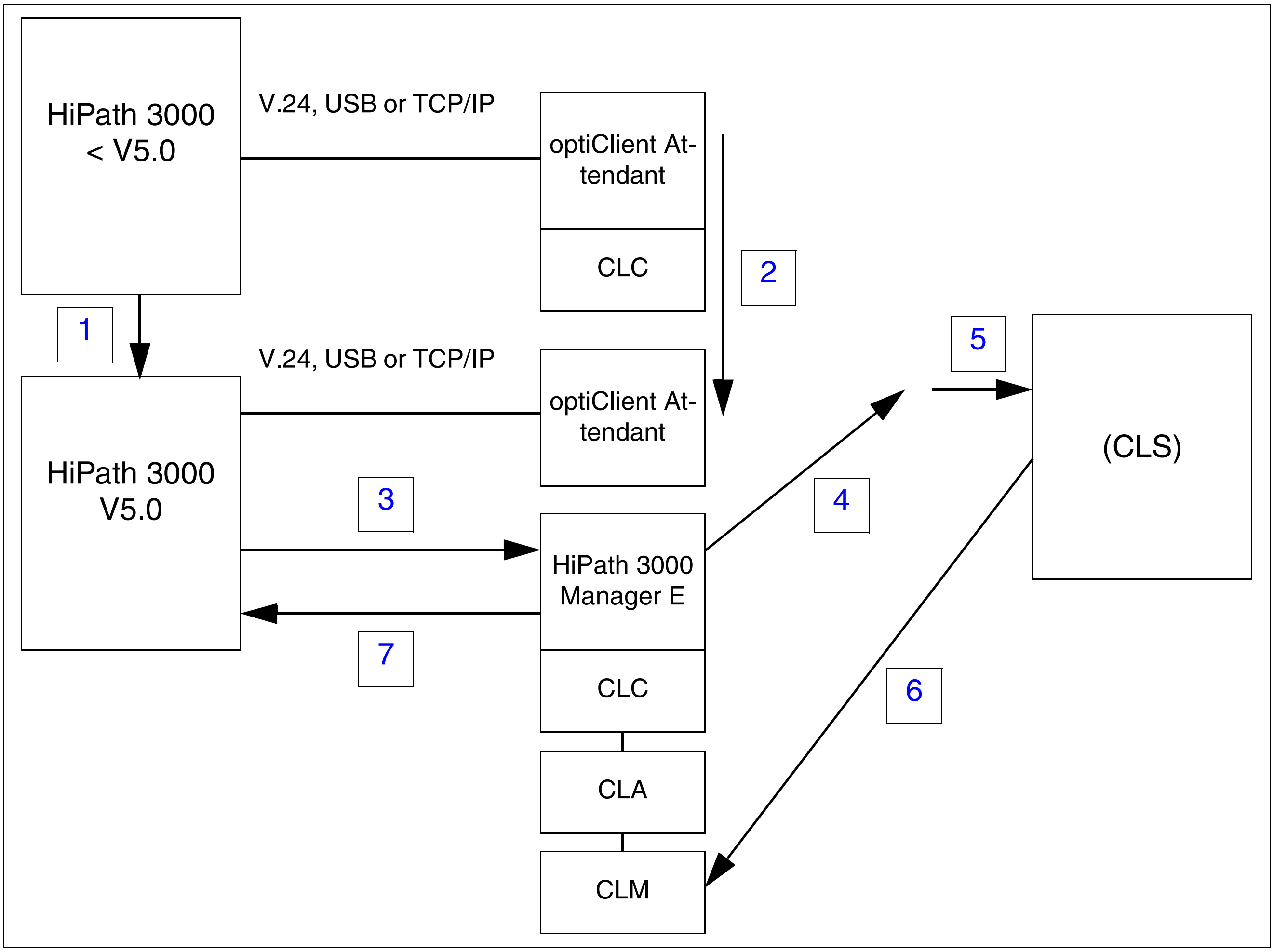

HiPath 3000
< V5.0
V.24, USB or TCP/IP
optiClient Attendant
CLC
2
1
V.24, USB or TCP/IP
optiClient Attendant
5
HiPath 3000
V5.0
(CLS)
3
4
HiPath 3000
Manager E
7
CLC
6
CLA
CLM

Figure 8-7 Changing Licenses on an optiClient Attendant V7.0 As Part of an Upgrade to HiPath 3000 V5.0

Step	Activity (Remarks)
1.	Upgrade HiPath 3000 to V5.0.
2.	At this point no steps are required. On startup, the optiClient Attendant identifies the HiPath 3000 software version and waits for a boot signal from HiPath 3000 V5.0. The IP address and port number of the CLA (configuration parameters) are not required when connecting a HiPath 3000 V5.0.
3.	Read the customer data record of the HiPath 3000 V5.0.
4.	Read out the MAC address of the HiPath 3000 control board.
5.	Perform a rehost on the CLS (change license to a new MAC address). This procedure can only be performed directly via the CLS (direct communication with the CLS via web browser).
6.	Transfer the license key or save it to the buffer memory. This is completed by manually entering the license to the CLA (performed on the CLM, offline activation).
7.	Write the customer data record to HiPath 3000 V5.0.
8.	Install optiClient Attendant(s). “Any” number of optiClient Attendants can be installed. However, HiPath 3000 monitors the number of licensed optiClient Attendants as part of the logon procedure. Depending on the model, up to six optiClient Attendants can be started per system. When the HiPath 3000 is started for the first time, a 30-day grace period begins. During this time, all HiPath 3000 features that require licensing (including optiClient Attendant) can be operated without a license. All features that require a license (including HiPath 3000s that have been subsequently installed) must be licensed before the grace period of the optiClient Attendant expires. The 30-day limit cannot be extended and a second grace period will not be granted. In this case, the CLS generates a license key for HiPath 3000 V5.0. Note: For CLS, an optiClient Attendant V7.0 is generally specified as a “HiPath 3000/5000 V5.0 product” and “HiPath 3000 optiClient Attendant V7.0 feature”.

8.6 Protection Against License Manipulation

HiPath License Management guarantees protection against any manipulation of the licenses. This includes, for example

- editing a license file
- changing the system time
- multiple read-in of licenses
- extension of the grace period
  When a Grace Period Configuration File (GPCF) is created, a flag is set in the system CDB and the Customer License Agent (CLA) to indicate that a GPCF file was created. This ensures that the 30-day period cannot be extended and the GPCF file cannot be regenerated.

> To guarantee the security and consistency of the product licenses generated, changes to the system time on the PC of an installed Customer License Agent (CLA) must not exceed one day.
> If the system clock is reset by more than one day, the Customer License Agent stops functioning and cannot be reactivated. The full functionality of the CLA on this PC can only be restored by means of a repair or a reinstallation (see the License Agent Installation Manual).

9 Expanding and Upgrading HiPath 3000

9.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Expanding HiPath 3000, page 9-2:
● Replacing Peripheral Boards for HiPath 3800, page 9-2
● Replacing Peripheral Boards for HiPath 3750 and HiPath 3700, page 9-4
● Connecting a printer, page 9-6
● ECR with HiPath 3700, HiPath 3500, HiPath 3300 (not for U.S. and Canada), page 9-8
● Connecting Special Equipment, page 9-24
Upgrading HiPath 3000 to V5.0, page 9-29
● Hardware Upgrade, page 9-29
● Software Upgrade, page 9-31

9.2 Expanding HiPath 3000

The following section provides information on supplementary equipment or extensions that are not described in **Chapter 4, “Installing HiPath 3000”**.

9.2.1 Replacing Peripheral Boards for HiPath 3800

> ⚠ **Caution**
> Always wear an antistatic wristband when working on the system (especially when handling boards).

HiPath 3800 lets you remove and insert peripheral boards during operation (hot plugging). The following startup rules apply.

Rules for removing and inserting boards

> ⚠ **Caution**
> To ensure that the system operates without blocking, you must follow the rules in Section 4.2.5 concerning board configuration.

Table 9-1 Startup Rules for Inserting and Removing Boards

If	Then
Inserting new board in free slot	Board is integrated into the system according to the rules for initial startup (Section 4.2.5.5). ● System with default numbering plan The station numbers from the new board are appended (consecutively and in ascending order) to the numbers already assigned. ● System with modified numbering plan The station numbers on the new board can be in any order. Using HiPath 3000 Manager E or Assistant T, you can assign a specific station to a port. If the number is already assigned to a different object, you can switch both numbers.
Replacing board with same or under equipped board type	Board is activated. The same station range is used.

Table 9-1 Startup Rules for Inserting and Removing Boards

If	Then
Replacing board with over-equipped board of same type	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available. In the case of subscriber line modules, you can use HiPath 3000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.
Replacing with a different board type	The system does not automatically activate the board. After removing the old board, you can delete it from the database using HiPath 3000 Manager E or Assistant T. After you have inserted the new board, the system activates it as if it had been inserted into a free slot. However, the CDB area used by the old board is left as a gap. In the case of subscriber line modules, you can use HiPath 3000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.

9.2.2 Replacing Peripheral Boards for HiPath 3750 and HiPath 3700

⚠ **Caution**
Always wear an antistatic wristband when working on the system (especially when handling boards).

HiPath 3750 and HiPath 3700 let you remove and insert peripheral boards during operation (hot plugging). The following startup rules apply.

Rules for removing and inserting boards

⚠ **Caution**
To ensure that the system operates without blocking, you must follow the rules in Section 4.3.6 concerning board configuration.

Table 9-2 Startup Rules for Inserting and Removing Boards

If	Then
Inserting new board in free slot	Board is integrated into the system according to the rules for initial startup (Page 4-154). ● System with default numbering plan The station numbers from the new board are appended (consecutively and in ascending order) to the numbers already assigned. ● System with modified numbering plan The station numbers on the new board can be in any order. Using HiPath 3000 Manager E or Assistant T, you can assign a specific station to a port. If the number is already assigned to a different object, you can switch both numbers.
Replacing board with same or under equipped board type	Board is activated. The same station range is used.
Replacing board with over-equipped board of same type	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available. In the case of subscriber line modules, you can use HiPath 3000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.

Table 9-2 Startup Rules for Inserting and Removing Boards

If	Then
Replacing with a different board type	The system does not automatically activate the board. After removing the old board, you can delete it from the database using HiPath 3000 Manager E or Assistant T. After you have inserted the new board, the system activates it as if it had been inserted into a free slot. However, the CDB area used by the old board is left as a gap. In the case of subscriber line modules, you can use HiPath 3000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.

9.2.3 Connecting a printer

Caution
Follow the safety and operating instructions provided by the printer manufacturer.

Introduction

You can use a printer as a CDR printer (serial data transmission) or as a call charge computer output device (parallel data transmission).

Connecting a CDR printer

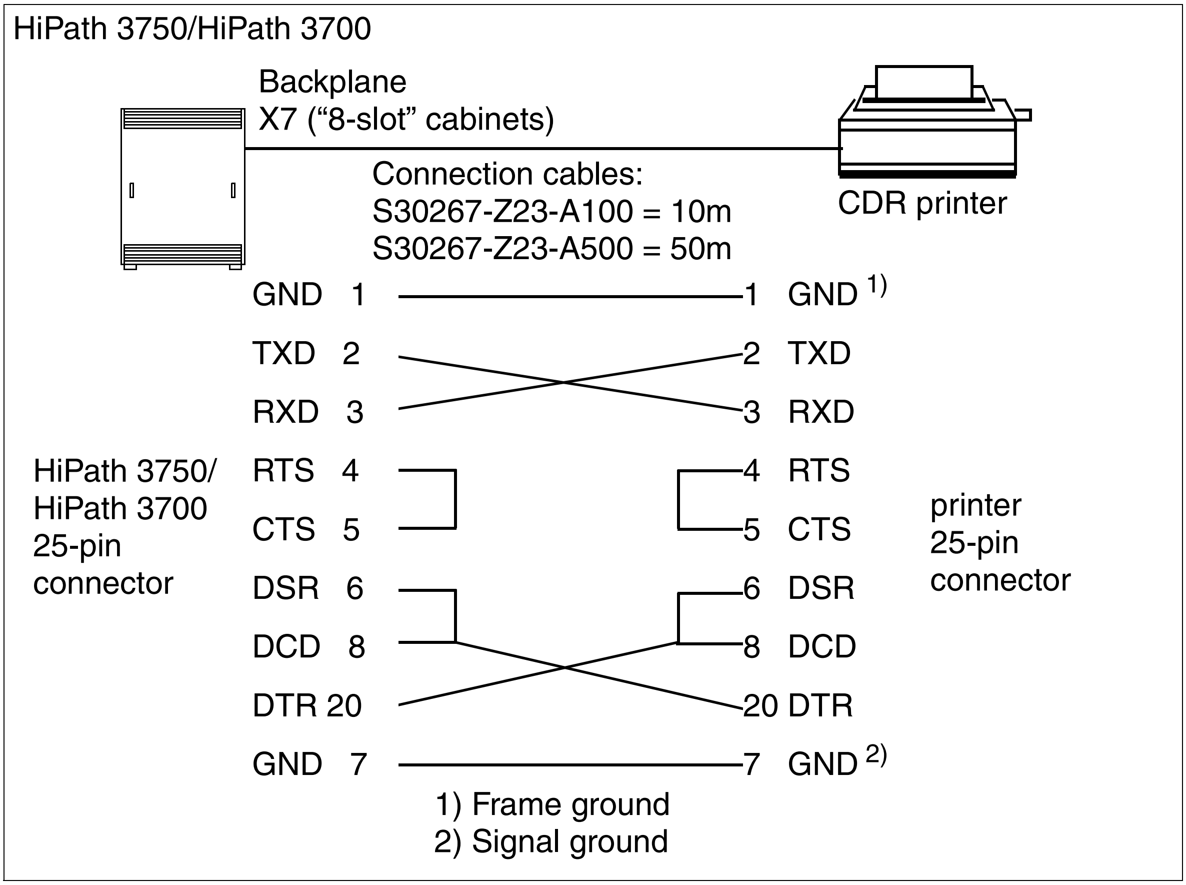

HiPath 3750/HiPath 3700
Backplane
X7 (“8-slot” cabinets)
Connection cables:
S30267-Z23-A100 = 10m
S30267-Z23-A500 = 50m
CDR printer
GND 1
TXD 2
RXD 3
RTS 4
CTS 5
DSR 6
DCD 8
DTR 20
GND 7
1 GND 1)
2 TXD
3 RXD
4 RTS
5 CTS
6 DSR
8 DCD
20 DTR
7 GND 2)
HiPath 3750/
HiPath 3700
25-pin
connector
printer
25-pin
connector
1) Frame ground
2) Signal ground

Figure 9-1 Sample Connection of a CDR Printer to HiPath 3000

Information on assigning V.24 interfaces from other systems is provided in the board descriptions in Chapter 3.

Output formats

For information about the output formats (compressed or uncompressed) for call detail recording central, see HiPath 3000/5000 Feature Description.

9.2.4 ECR with HiPath 3700, HiPath 3500, HiPath 3300 (not for U.S. and Canada)

Danger
An expansion cabinet rack (ECR) equipped with an external power supply unit (EPSU2-R) may only be operated if the housing is closed.
Before opening the housing, disconnect the ECR from the power supply by

- setting the switches for battery voltage and line voltage on the ECR’s front panel to "Off".
- removing the battery fuse on the ECR front panel and
- unplugging all power and connection cables.

Introduction

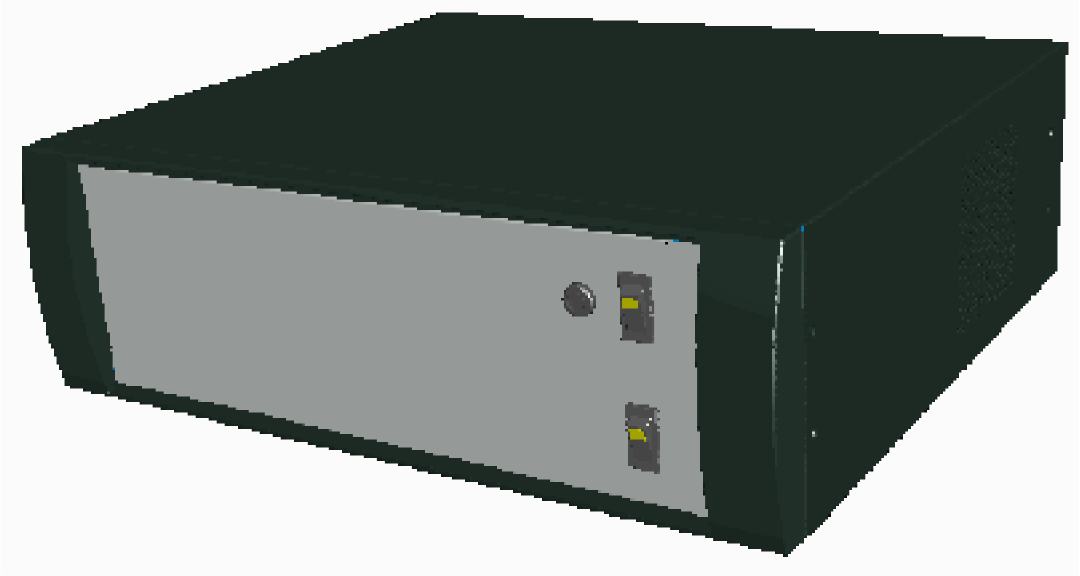
When installing the system, an ECR in the 19” cabinet is required if

- emergency battery operation is necessary during a power failure or if the system requires uninterruptible power.
  The necessary batteries are installed in the ECR.
- the internal system power supply unit for HiPath 3500 or HiPath 3300 is not sufficient enough to provide power to the overall telephone configuration (corded or cordless telephones).
  In this case, the EPSU2-R external power supply unit should be installed in the ECR.

9.2.4.1 ECR Control, Display, and Connecting Elements

Front panel (Figure 9-2)

- Top switch for disconnecting battery power
- Bottom switch for disconnecting line power
- 6.3 A/T battery fuse (warning: do not confuse with EPSU2-R fuse)



Necessary height units for 19-inch cabinet assembly: 4
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 9-2 ECR Front Panel (155 x 440 x 380 mm)

Rear panel (Figure 9-3)

- Line voltage connections [1]
  - Top: Line output to UPSC-DR connection jack for HiPath 3500 and HiPath 3300
  - Below: Line input
- Batteries/EPSU2-R [2] output voltage to UPSC-DR for HiPath 3500 and HiPath 3300
  or
  Batteries output voltage [2] to UPSM for HiPath 3700
- Clip [3]
  Attach the braided screen of the connection cable (to the jack [2]) here.

If an EPSU2-R external power supply unit is installed in the ECR, the following additional display and control elements are also included:

- EPSU2-R 2.5 A/T [4] battery fuse (warning: do not confuse with battery fuse on the ECR front panel)
- LED [5] for the -48-V output voltage (DC output) in the EPSU2-R (see Table 9-3)
- LED [6] for the line input voltage (AC input) in the EPSU2-R (see Table 9-3)

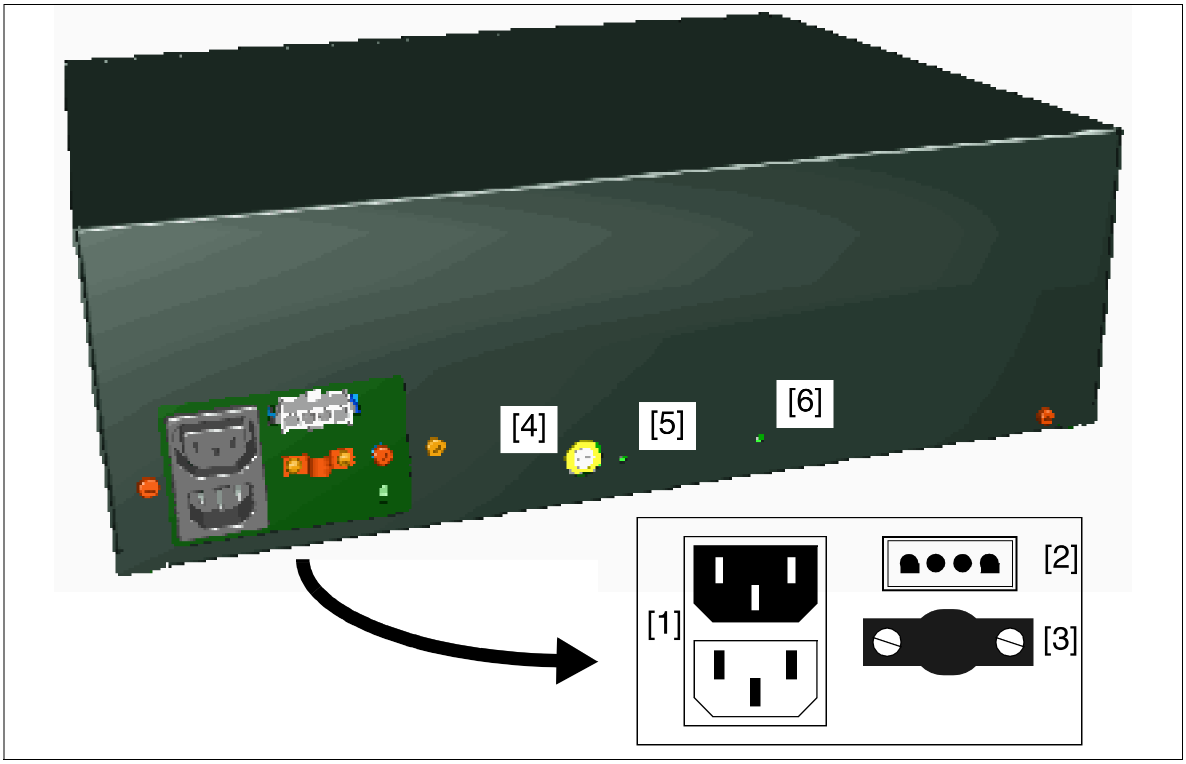


Figure 9-3 ECR Rear Panel With Connecting Elements

Table 9-3 EPSU2-R - Explanation of Display and Connecting Elements

LED [6] **(DC output)**	**LED [7]** **(AC input)**	**Description**
On	On	DC output and AC input voltages are OK.
Off	On	No DC voltage at output (for example DC load short-circuited).
On	Off	No AC voltage at input (power failure or system powered by batteries, including additional power).
Off	Off	No AC input voltage (power outage) and batteries are empty, or the EPSU2-R fuse is defective or was removed (by turning to the left).

9.2.4.2 Components

- Expansion cabinet rack (ECR): S30777-U711-E901
  The scope of delivery includes:
  - A mounting set for installing the ECR in a 19-inch cabinet: C39165-A7027-D1
  - A mounting clamp: D72571-A80-S3
  - A toothed lock washer: D6797-A43-S657
- Mounting set for ECR wall installation or ECR table setup: C39165-A7027-D2
- EPSU2-R: S30122-K7221-X900
  A cable for making the ECR – HiPath 3500 or HiPath 3300 electrical connection is included in the delivery: C39195-Z7001-C14
- 4 batteries, 12 V/7 Ah: 4 x V39113-W5123-E891
- Connection cable, ECR (batteries) – HiPath 3700 (UPSM + power failure signaling (lamp-wire connector): a relay connected in series can be used for signaling purposes, for example.): C39195-A7002-B11
- Connection cable, ECR – HiPath 3500 or HiPath 3300: S30267-Z361-A10

Caution
Both of the above-mentioned connection cables are system-specific.
- C39195-A7002-B11 is exclusively designed for HiPath 3700.
- S30267-Z361-A10 is exclusively designed for HiPath 3500 and HiPath 3300.

Failure to observe the above may damage the power supply unit.

9.2.4.3 Installation Options

Use the power cable to ground the ECR. Fixed, separate grounding is not required.

The expansion cabinet rack ECR can be

- installed in a 19-inch cabinet (see Section 4.4.4.5).
- mounted on a wall (see Section 4.4.4.4).
- set up on a table using four adhesive mounting feet.

9.2.4.4 Expansion Cabinet Rack ECR With Batteries

Danger
Before opening the housing, disconnect the ECR from the power supply by
- setting the switches for battery voltage and line voltage on the ECR’s front panel to "Off".
- removing the battery fuse on the ECR front panel and
- unplugging all power and connection cables.

When using the UPSM or the UPSC-DR as the uninterruptible power supply unit, you need to install additional batteries in the ECR.

The ECR and batteries are packaged separately and included in the delivery. The batteries should be installed as described in Section 9.2.4.4.1. Only use batteries approved for HiPath 3000.

Figure 9-5 shows the position of the four batteries inside the ECR.

The circuit diagram below illustrates the cable run between the batteries in the ECR and the power supply unit of the system (UPSM for HiPath 3700, UPSC-DR for HiPath 3500 and HiPath 3300). The connection cable between the expansion cabinet rack ECR and the system cabinet is also provided.

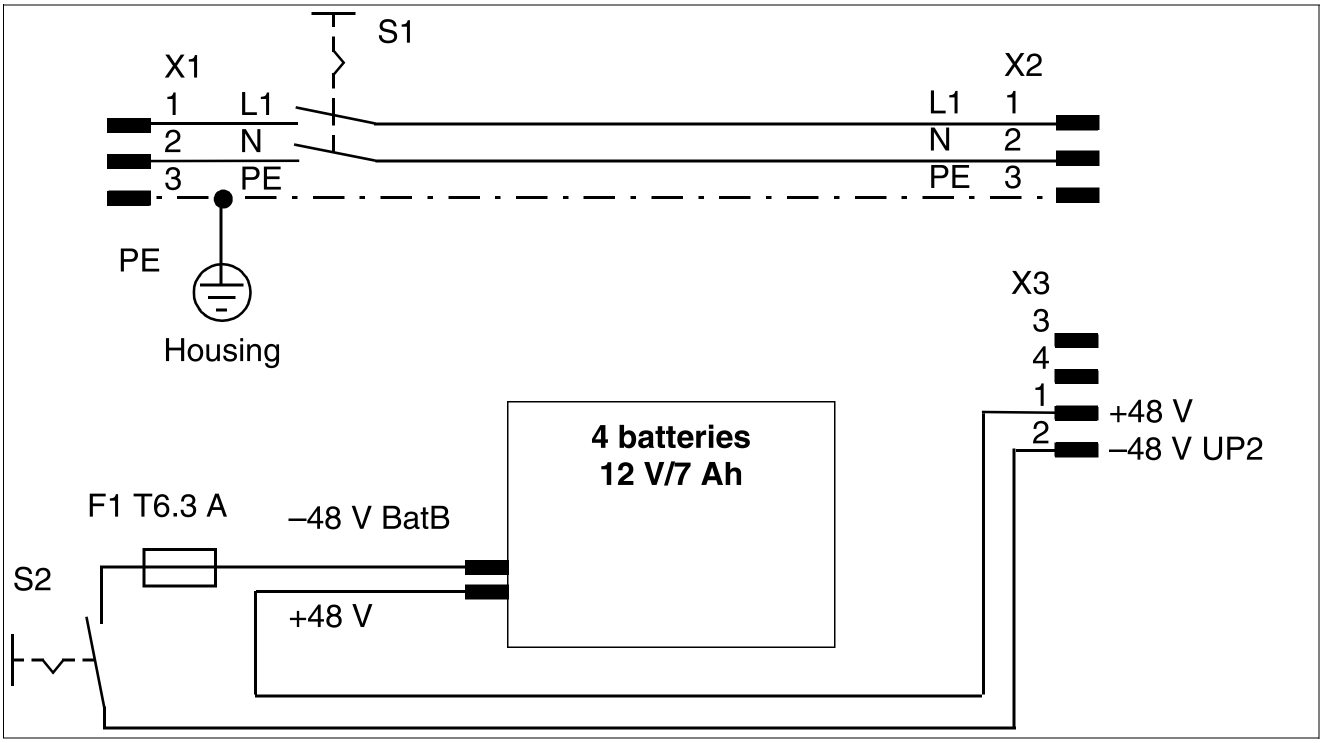


Figure 9-4 HiPath 3700, HiPath 3500, HiPath 3300 - ECR With Batteries

Caution
When storing an ECR equipped with batteries or if the ECR is inactive for a long period of time, remove the battery fuse (6.3 A/T) in the front panel of the ECR.
When shipping an ECR with built-in batteries, the batteries must be removed beforehand.

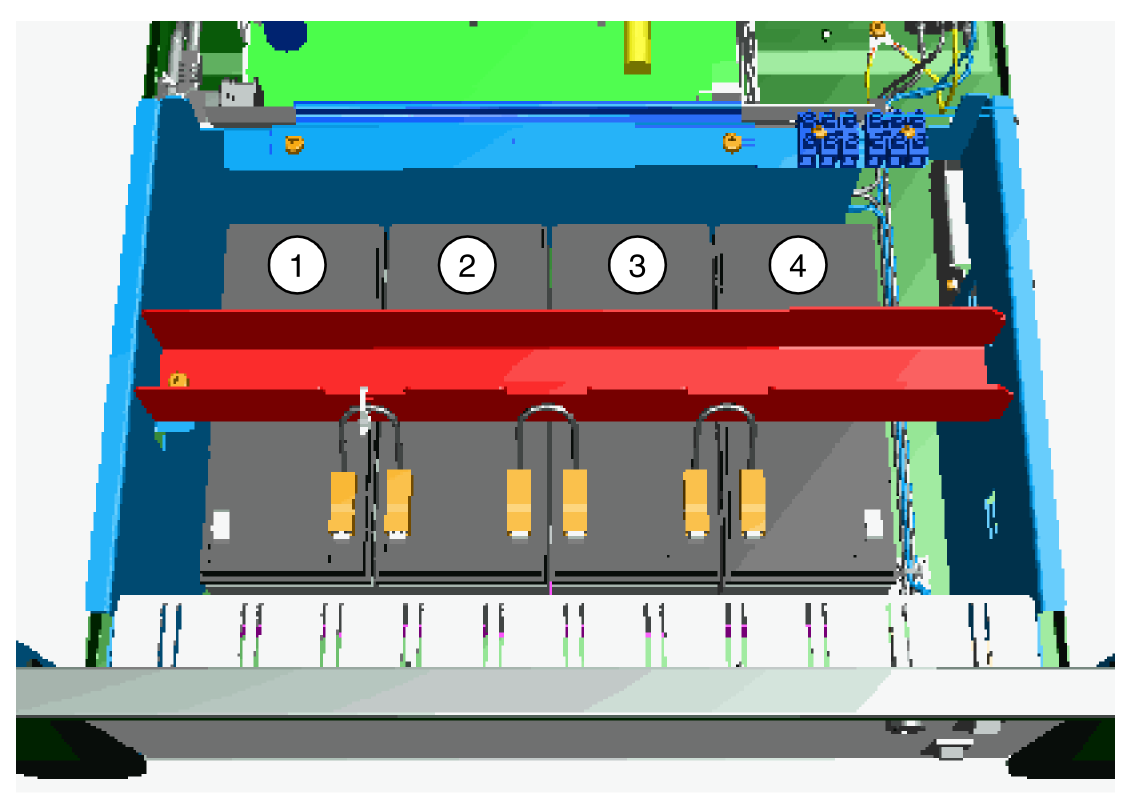
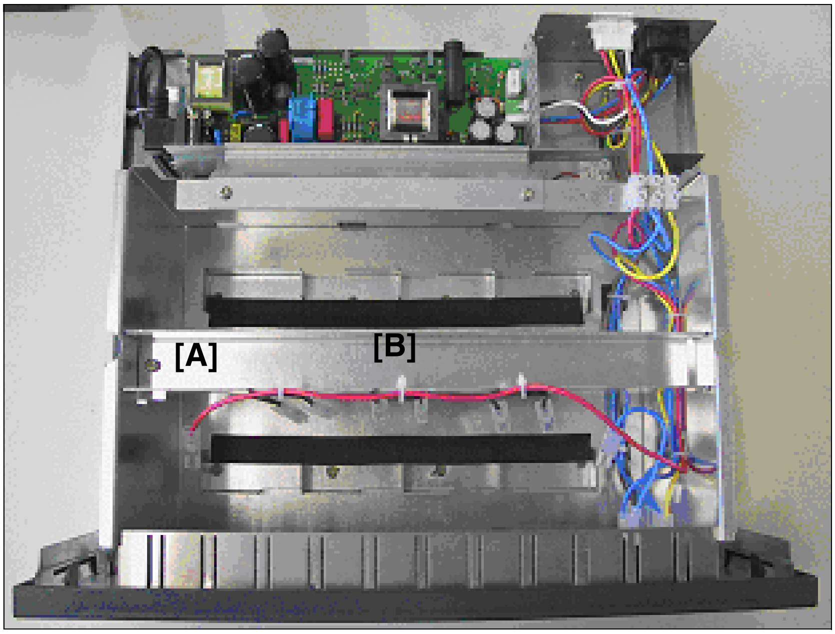


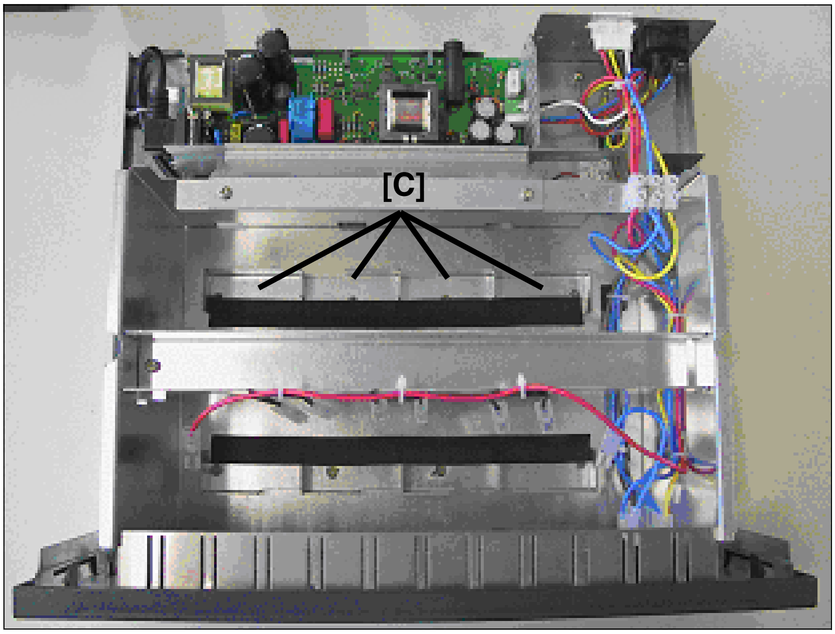
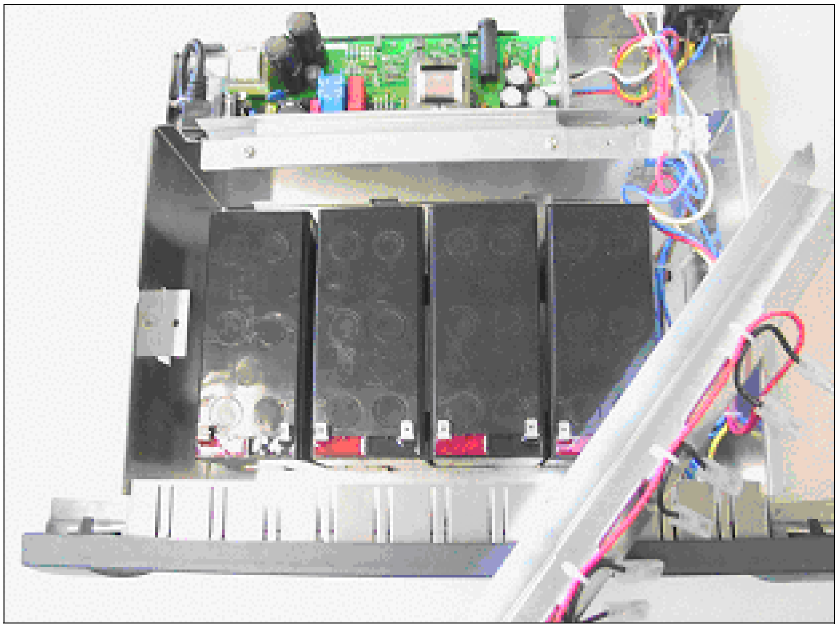
Figure 9-5 ECR With Built-In Batteries

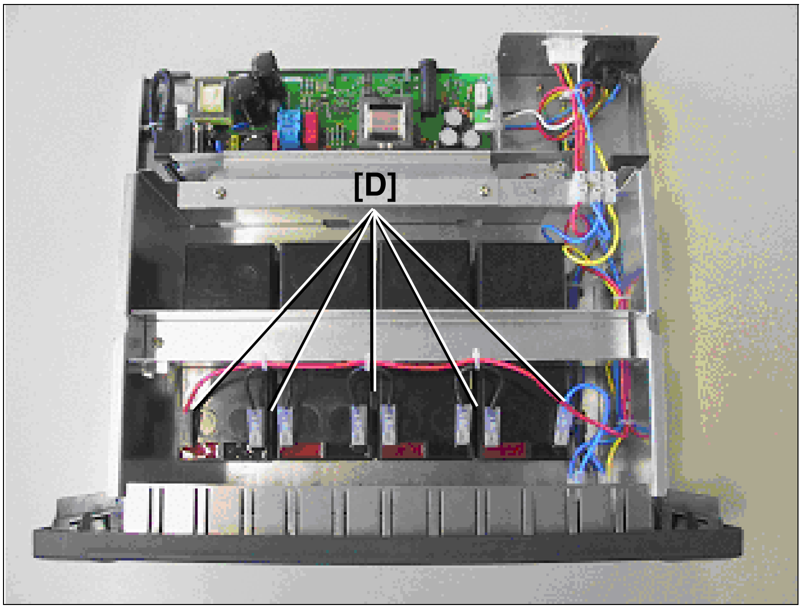
9.2.4.4.1 Installing Batteries

> ⚠ **Danger**
> Only V39113-W5123-E891 (12 V/7 Ah) batteries are released for connection to the UPSC-DR/UPSM and installation in the ECR.
> The use of other battery types is prohibited.

ECR is supplied with four batteries in a separate package. Proceed as follows to install the batteries in the ECR:

Step	Activity
1.	Set the switches for battery voltage and line voltage on the ECR's front panel to "Off" (see Section 9.2.4.1).
2.	Remove the battery fuse (ECR front panel) (see Section 9.2.4.1).
3.	Unplug all of the ECR's power and connection cables.
4.	Remove the ECR housing cover: To do this, remove the three screws at the rear and slide the housing cover back.
5.	Remove the mounting screw [A] on the battery retainer [B]. 
6.	Remove the battery retainer and set aside.

Step	Activity
7.	Insert the batteries carefully in the recesses provided [C].  
8.	Replace the battery retainer and secure the mounting screw.

Step	Activity
9.	Connect the batteries: To do this, slide the eight cable connector lugs [D] carefully onto the two connection contacts on each of the four batteries. 
10.	Replace the ECR's housing cover and secure the three mounting screws at the rear.
11.	Connect all of the ECR's power and connection cables.
12.	Insert the battery fuse (ECR front panel) (see Section 9.2.4.1).
13.	Set the switches for battery voltage and line voltage on the ECR's front panel to "On" (see Section 9.2.4.1).

9.2.4.5 Expansion Cabinet Rack ECR With Batteries and EPSU2-R

Danger

An expansion cabinet rack (ECR) equipped with an external power supply unit (EPSU2-R) may only be operated if the housing is closed.

Before opening the housing, disconnect the ECR from the power supply by

- setting the switches for battery voltage and line voltage on the ECR’s front panel to "Off".
- removing the battery fuse on the ECR front panel and
- unplugging all power and connection cables.

If the internal system power supply unit for HiPath 3500 or HiPath 3300 does not provide enough power for the overall telephone configuration (corded and cordless telephones), an additional power supply is necessary. In this case, the EPSU2-R external power supply unit should be installed in the ECR.

Figure 9-7 shows the position of the EPSU2-R inside the ECR.

The block diagram below illustrates the cable run between the EPSU2-R and the batteries inside the ECR and the power supply unit of the system (UPSC-DR). The connection cable between the expansion cabinet rack ECR and the system cabinet is also provided.

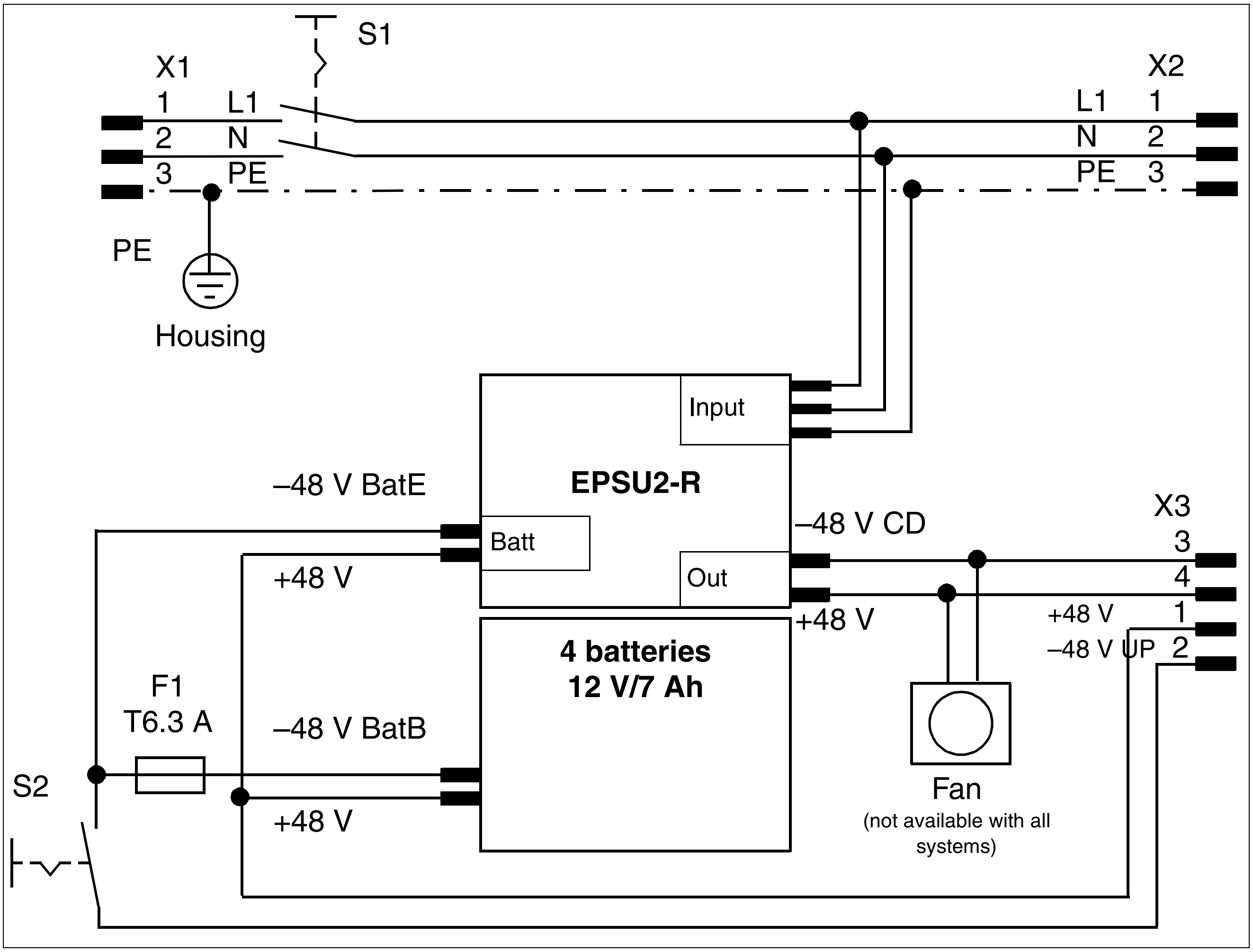

S1
X1
1 L1
2 N
3 PE
PE
Housing
X2
L1 1
N 2
PE 3
Input
EPSU2-R
–48 V BatE
Batt
+48 V
Out
–48 V CD
X3
3
4
+48 V
+48 V 1
–48 V UP 2
4 batteries
12 V/7 Ah
F1
T6.3 A
–48 V BatB
+48 V
S2
Fan
(not available with all systems)

Figure 9-6 HiPath 3500, HiPath 3300 - ECR With Batteries and EPSU2-R

Caution
When storing an ECR equipped with batteries or if the ECR is inactive for a long period of time, remove the battery fuse (6.3 A/T) in the front panel of the ECR.
When shipping an ECR with built-in batteries, the batteries must be removed beforehand.

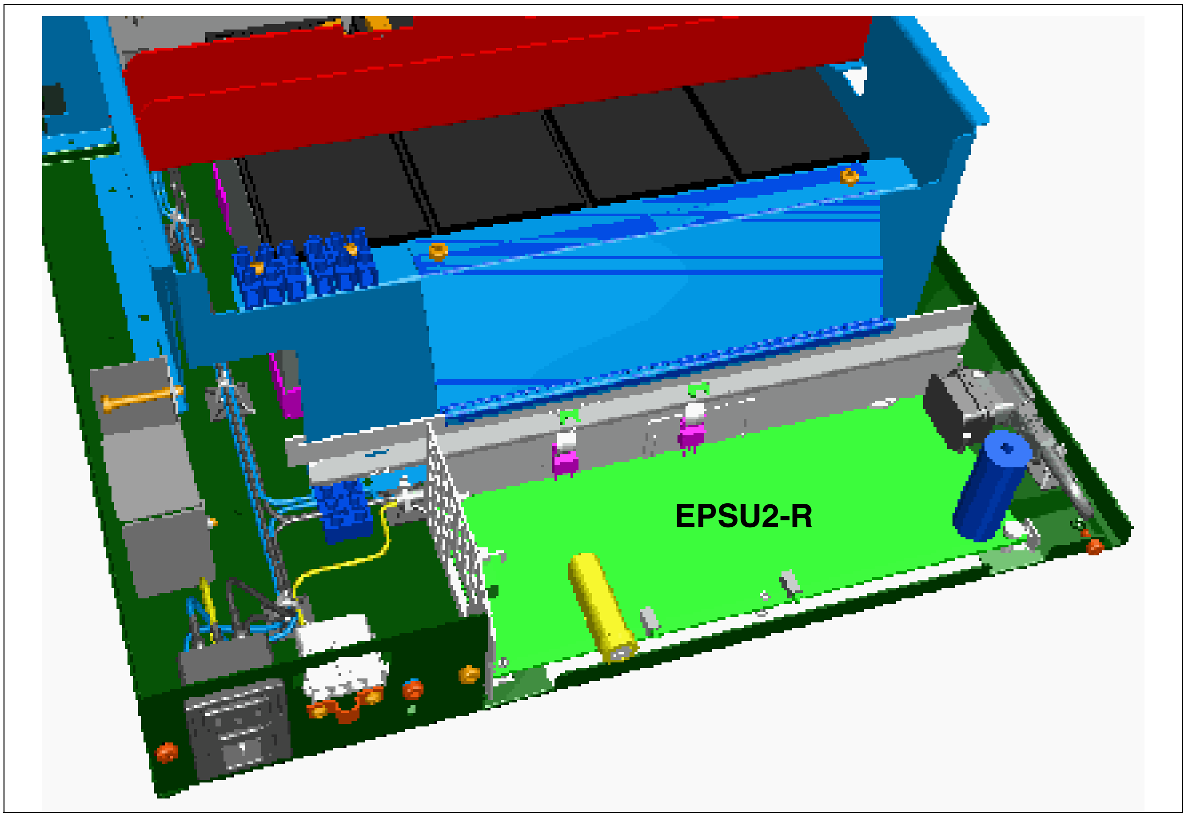


Figure 9-7 ECR with Built-In EPSU2-R

9.2.4.5.1 Connecting a Fan (if needed)

The ECR delivery usually includes a fan that is built in but not connected.

To connect the fan, proceed as follows:

Step	Activity
1.	Set the switches for battery voltage and line voltage on the ECR’s front panel to "Off" (see Section 9.2.4.1).
2.	Remove the battery fuse (ECR front panel) (see Section 9.2.4.1).
3.	Unplug all of the ECR’s power and connection cables.
4.	Remove the ECR housing cover: To do this, remove the three screws at the rear and slide the housing cover back.
5.	Cut off the plug on the fan connection line if there is one. Strip both wire ends and attach wire end sleeves.
6.	Connect both connection wires to the EPSU2-R terminal [A] as shown in Figure 9-8. Connect the red wire (fan) to the white wire (EPSU2-R) and the black wire (fan) to the black wire (EPSU2-R). Figure 9-6 shows the cable run between EPSU2-R and the fan.
7.	Replace the ECR’s housing cover and secure the three mounting screws at the rear.
8.	Connect all of the ECR’s power and connection cables.
9.	Insert the battery fuse (ECR front panel) (see Section 9.2.4.1).
10.	Set the switches for battery voltage and line voltage on the ECR’s front panel to "On" (see Section 9.2.4.1).

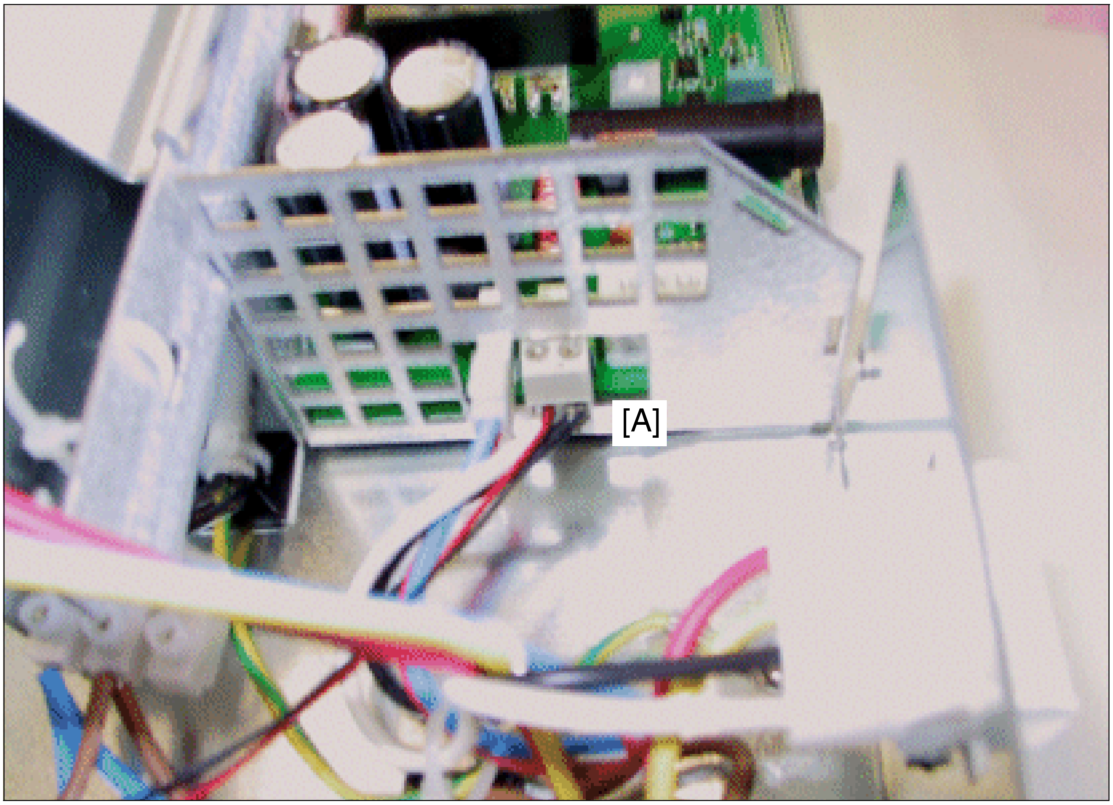


Figure 9-8 Connecting the Fan to the EPSU2-R

If you install the fan at a later time, you must make sure that the identification ([B] in Figure 9-9) is in the upper right corner when viewed from outside.

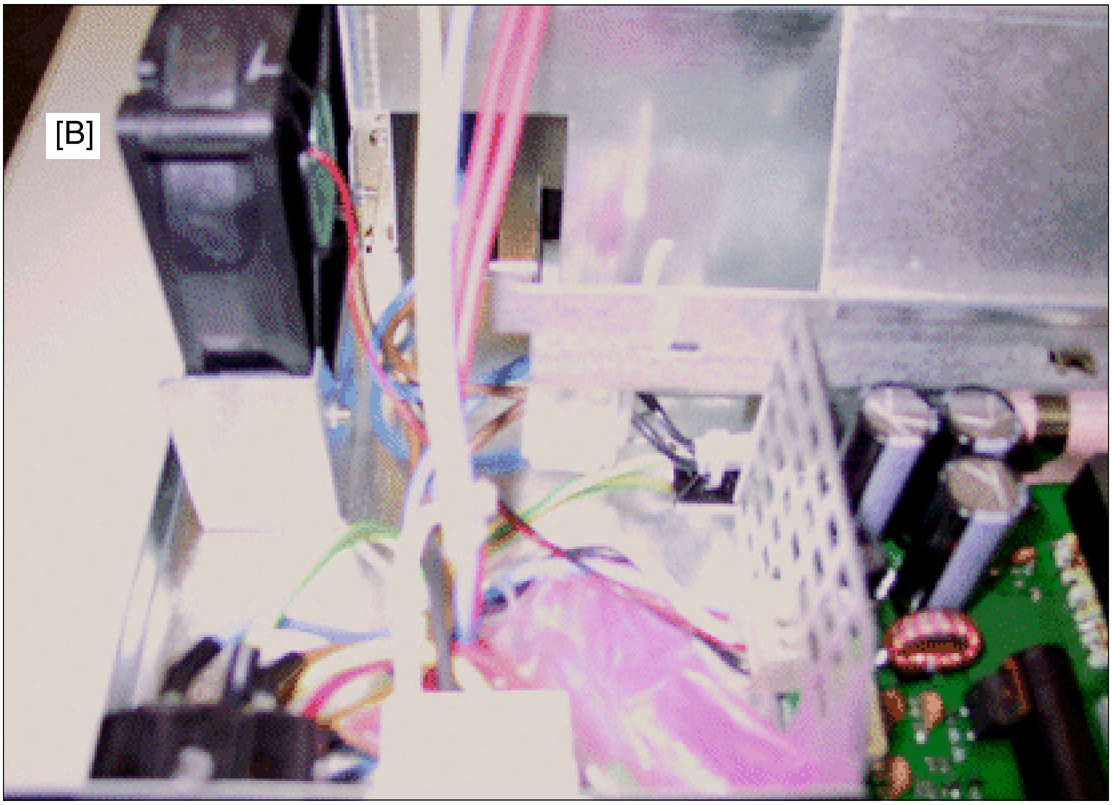


Figure 9-9 Placement of the Fan in the ECR

9.2.5 Connecting Special Equipment

9.2.5.1 Entrance Telephones

Connection options

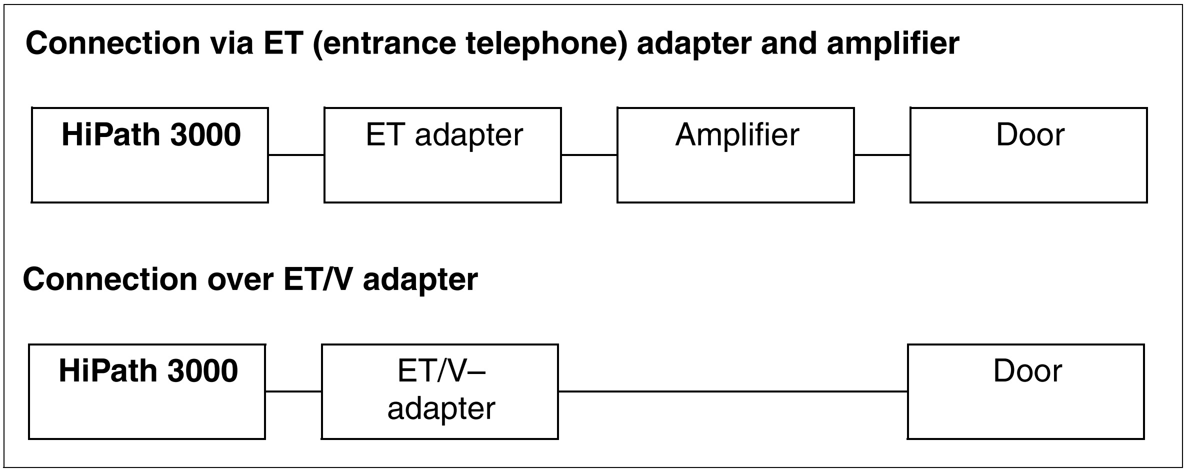

Connection via ET (entrance telephone) adapter and amplifier
HiPath 3000
ET adapter
Amplifier
Door
Connection over ET/V adapter
HiPath 3000
ET/V–
adapter
Door

Figure 9-10 Connection Options for Entrance Telephones

The new central control boards CBCC (S30810-Q2935-A301) and CBRC (S30810-Q2935-Z301) only support TFE-S-Adapter S30122-K7696-T313.

You can also make a direct connection if needed. In this case, only voice connections to the entrance telephone are possible, without the support of the opener and signal functions.

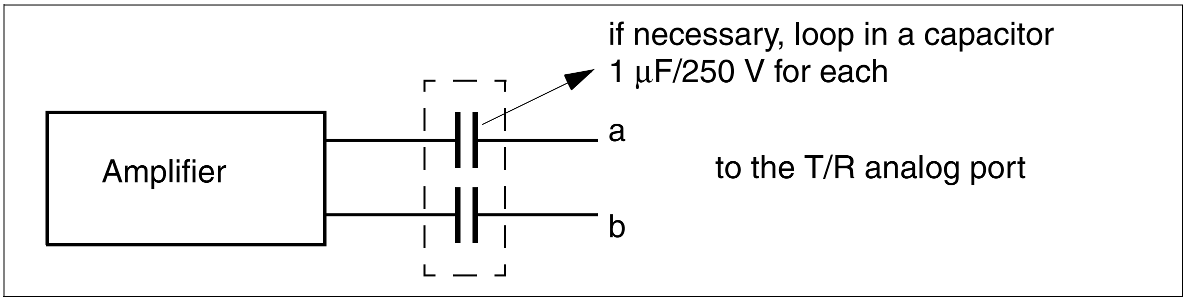

if necessary, loop in a capacitor
1 µF/250 V for each
Amplifier
a
b
to the T/R analog port

Figure 9-11 Direct Connection of Entrance Telephones

9.2.5.1.1 Information on Third-Party Entrance Telephones

DoorCom Analog

General information

The plus product DoorCom® Analog is a universal entrance telephone adapter box for Siedle entrance telephones (such as the Vario TLM 612). It is released for use with all HiPath 3000 systems, V1.2 and later.

It is connected to an analog port in the system. DoorCom Analog behaves like an analog telephone (DTMF tone dialing, detection, and control). It can be operated with DTMF signals.

DoorCom Analog can function only in combination with the following components:

- DoorCom Analog DCA 612-0
- Siedle-Vario TLM 612 entrance telephone
- Switching remote control interface DCSF 600
  For the voice connection of an internal user to the entrance telephone: Without this module, it is not possible to call back to the entrance telephone, for example, if a call was unintentionally cleared down by the entrance telephone.)
- Power supply NG 602-0

Connection

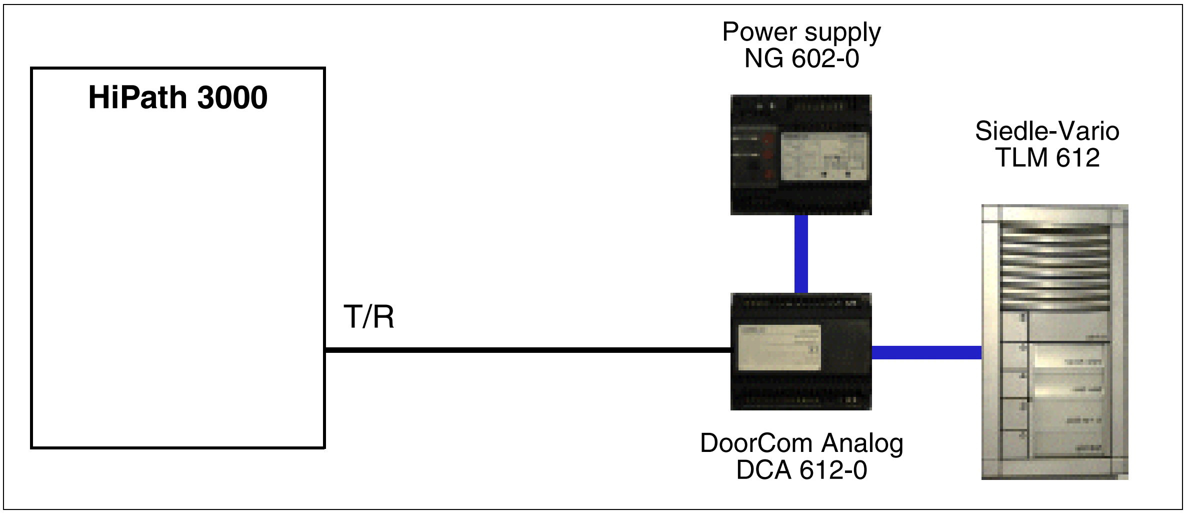


Figure 9-12 Connecting DoorCom Analog to HiPath 3000

Configuration Notes for HiPath 3000 Manager E

DoorCom Analog

Set up station: Stations: Parameters:
Extension Type = Standard
Flags = Call waiting rejection on

System parameters:
Flags = DTMF automatic

Remote station (telephone)

Set up station: Stations: Parameters:
Flags = Call waiting rejection off
Flags = Missed Calls List

Device control features (open doors, select entrance telephone, etc.) can be programmed on procedure keys. The stored DTMF signal sequence is sent to the application.

9.2.5.2 Connecting Speakers

You have the following options:

- Connection to an analog station port (the amplifier may require level adaptation)
- Connection to an analog station port over an ET adapter
- Connection to an analog trunk circuit

Connecting speakers to an analog station port

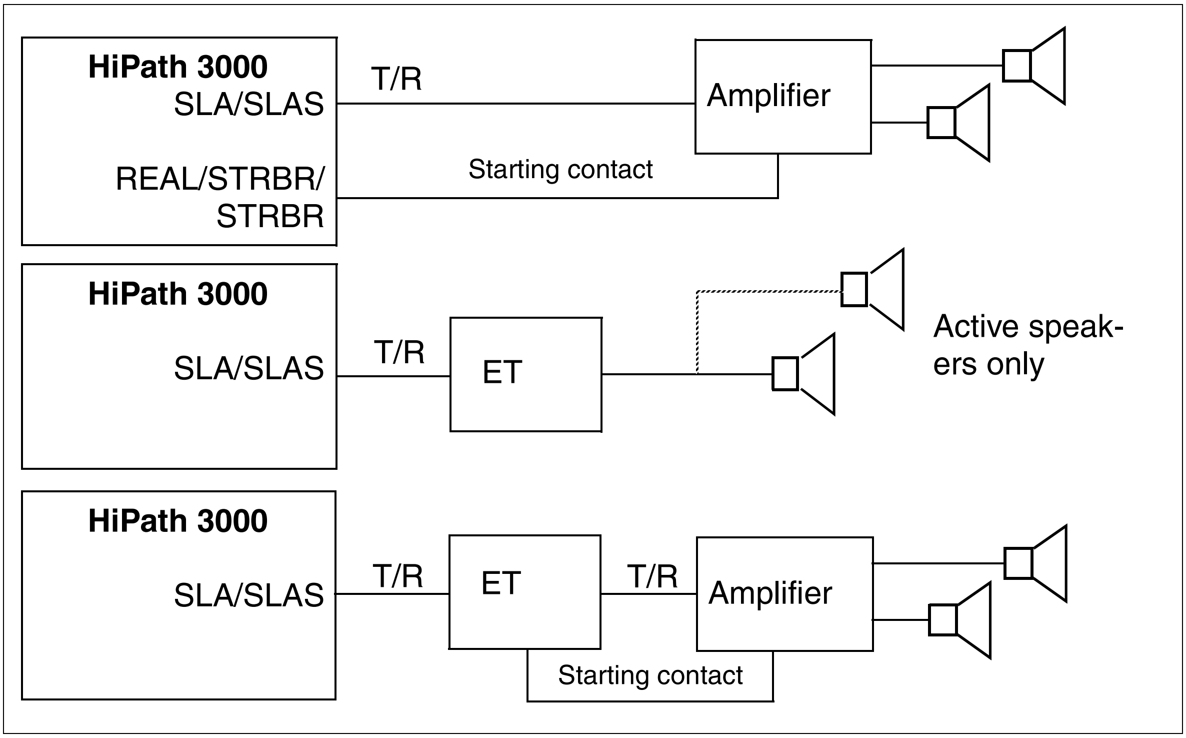

HiPath 3000
SLA/SLAS
T/R
Amplifier
REAL/STRBR/
STRBR
Starting contact
HiPath 3000
SLA/SLAS
T/R
ET
Active speakers only
HiPath 3000
SLA/SLAS
T/R
ET
T/R
Amplifier
Starting contact

Figure 9-13 Connecting Speakers to an Analog Station Port

Connecting speakers to an analog trunk port

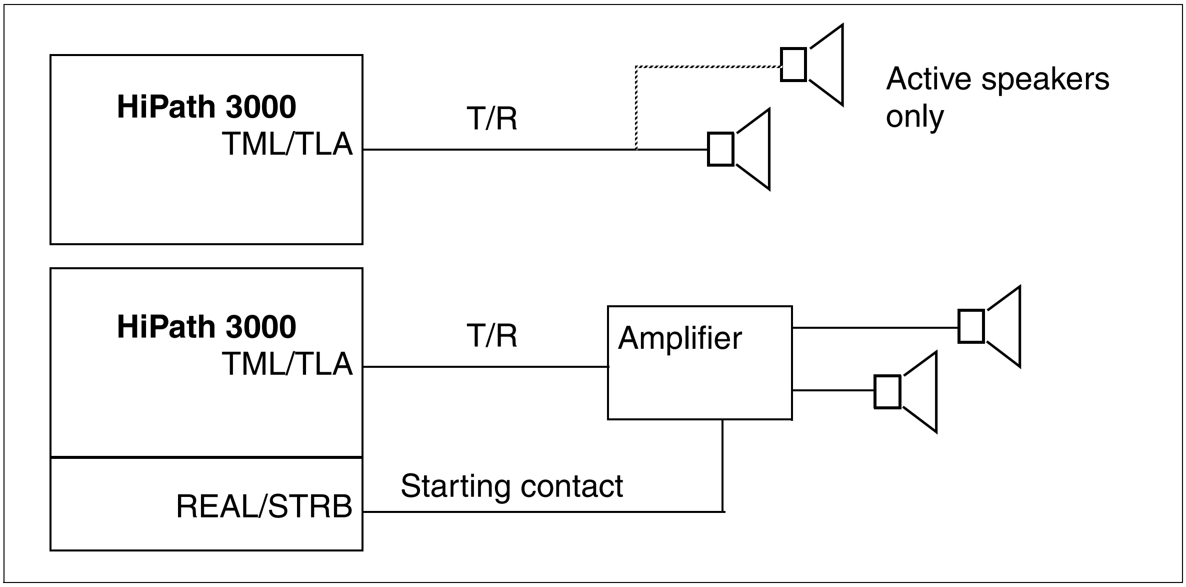

HiPath 3000
TML/TLA
T/R
Active speakers only
HiPath 3000
TML/TLA
T/R
Amplifier
REAL/STRB
Starting contact

Figure 9-14 Connecting Speakers to an Analog Trunk Port

9.3 Upgrading HiPath 3000 to V5.0

The following information describes the measures that are needed to upgrade the hardware **and** software.

It is not possible to upgrade HiPath 3550 to HiPath 3500 or HiPath 3350 to HiPath 3300. This would require replacing the complete system.

9.3.1 Hardware Upgrade

The following hardware requirements apply to HiPath 3000/5000 V5.0 and higher.

Contol Boards

If the control board necessary for operating HiPath 3000/5000 V5.0 and higher is not available, a replacement must be performed.

System	Control board necessary for HiPath 3000/5000 V5.0 and higher
HiPath 3800	CBSAP, S30810-Q2314-X and higher
HiPath 3750 HiPath 3700	CBCPR, S30810-Q2936-X-J2 and higher
HiPath 3550 HiPath 3350	CBCC, S30810-Q2935-A301 and higher
HiPath 3500 HiPath 3300	CBRC, S30810-Q2935-Z301 and higher

Note for upgrading from hardware < version 1.2:
If the following subboards are present, they must be replaced: IMODN (replaces the IMOD), MMC (replaces the FMC), CMA/CMS (replaces the CGM/CGMC).

For Deutsche Telekom AG only: The CBCP board S30810-Q2935-B201 must be replaced by a CBCC board S30810-Q2935-A301.

Multimedia card MMC

An MMC with 64 MB is required to run HiPath 3000/5000 V5.0 and higher.

HG 1500 boards

The HG 1500 boards listed in the following table are necessary for using the HG 1500 functionality with HiPath 3000/5000 V5.0 and higher. Unnamed HG 1500 boards must be replaced.

System	HG 1500 board required for HiPath 3000/5000 V5.0 and higher
HiPath 3800	STMI2, S30810-Q2316-X100 and higher
HiPath 3750 HiPath 3700	HXGM3, S30810-Q2942-X and higher
HiPath 3550 HiPath 3350	HXGS3, S30810-Q2943-X and higher
HiPath 3500 HiPath 3300	HXGR3, S30810-K2943-Z and higher

9.3.2 Software Upgrade

If the software is a version earlier than V3.0, it must first be upgraded to V3.0. Only then is it possible to upgrade the software to V5.0.

CDB conversion is also necessary.

Procedure: Customer database (CDB) conversion

> **Please note the following:**
> S_0 stations can be configured as both HFA clients and vCAPI clients in V4.0. In addition, V4.0 does not have a selected gatekeeper board. This configuration will have to be re-defined when upgrading to V5.0 (see Figure 9-15).
> The flowchart on Page 9-32 describes the procedure for converting the CDB from V4.0 to V5.0. First, you must edit the V4.0 CDB. Then you must convert the CDB and finally, edit the V5.0 CDB.
> No other changes are necessary apart from modifications for IP workpoint clients and IP lines. Only the gatekeeper and gateway data has to be edited. Telephone numbers and other properties of the IP workpoint clients are retained. The protocol has to be modified for the IP lines.

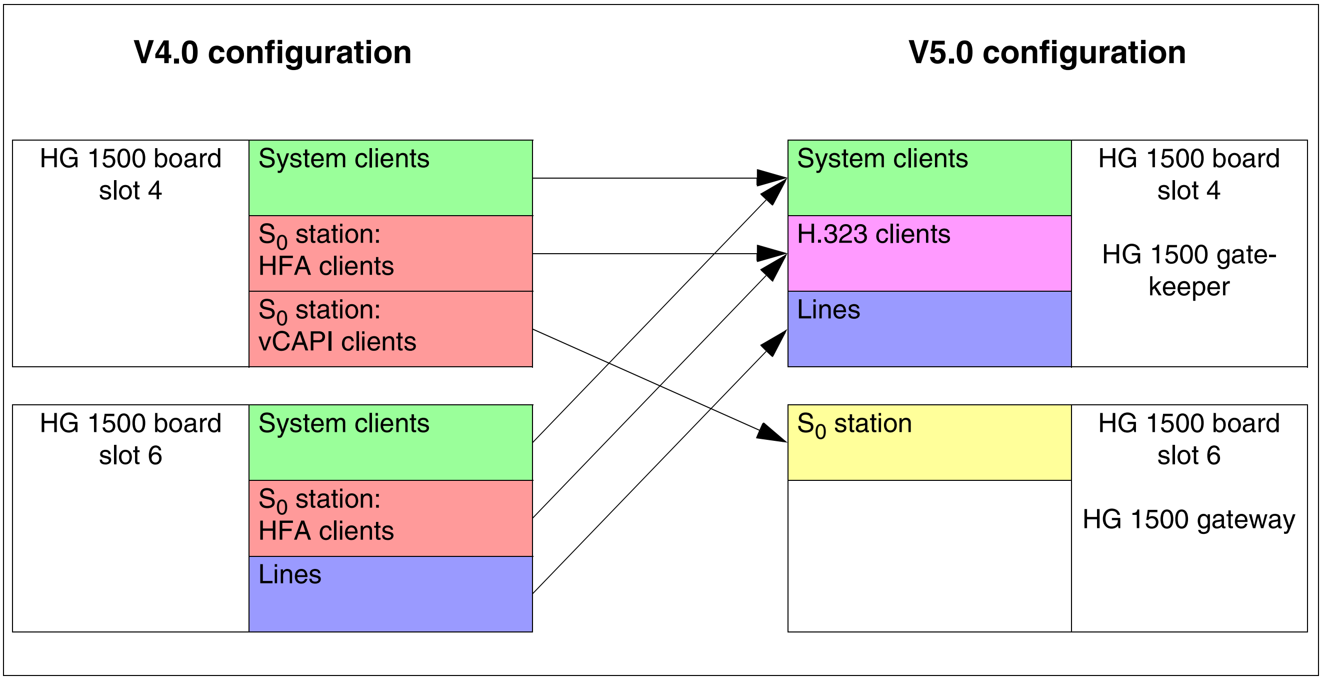

V4.0 configuration
V5.0 configuration
HG 1500 board slot 4
System clients
S0 station: HFA clients
S0 station: vCAPI clients
HG 1500 board slot 6
System clients
S0 station: HFA clients
Lines
System clients
H.323 clients
Lines
HG 1500 board slot 4
HG 1500 gate-keeper
S0 station
HG 1500 board slot 6
HG 1500 gateway

Figure 9-15 Differences Between V4.0 and V5.0 Configurations

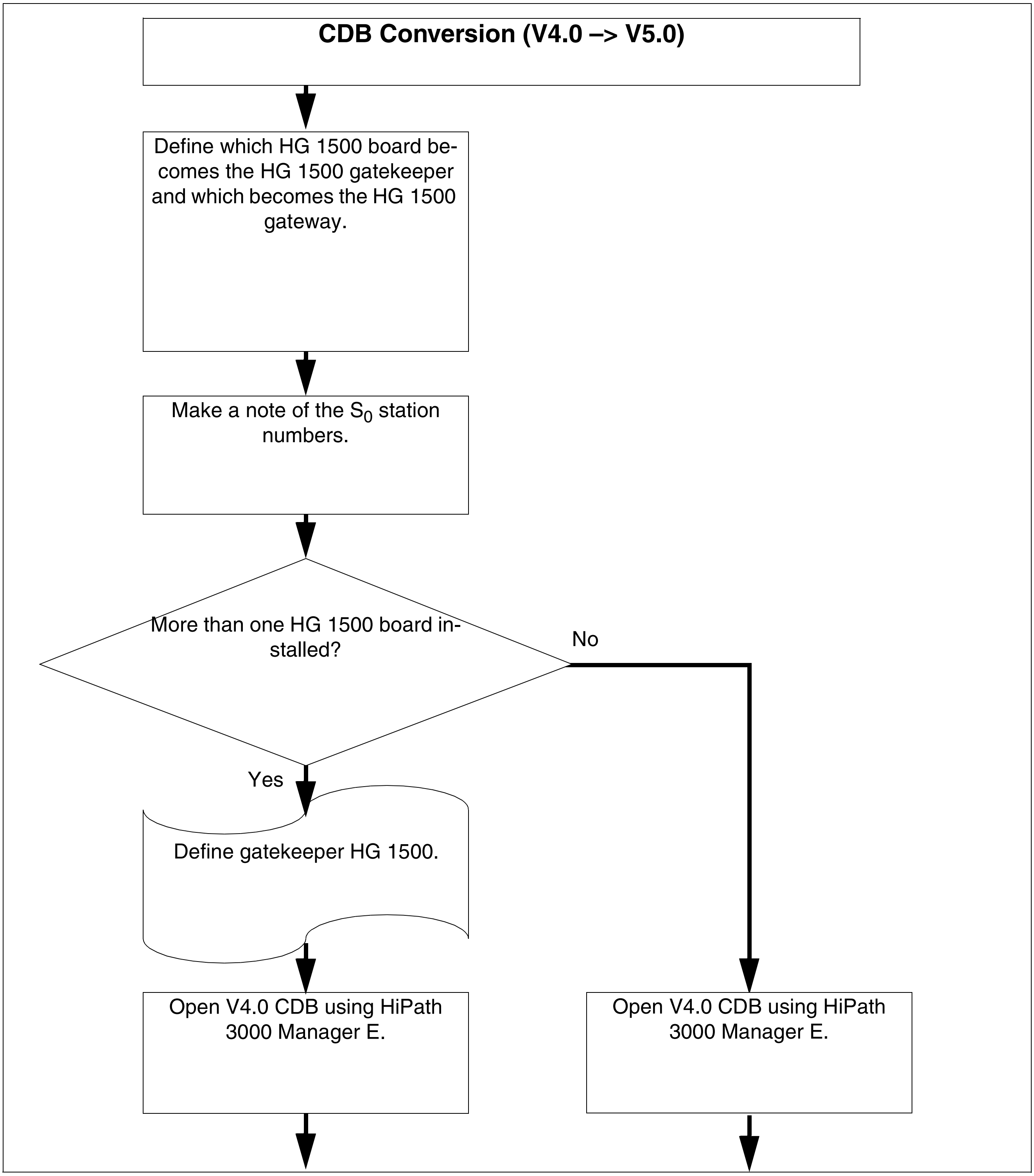

CDB Conversion (V4.0 –> V5.0)
Define which HG 1500 board becomes the HG 1500 gatekeeper and which becomes the HG 1500 gateway.
Make a note of the S_0 station numbers.
More than one HG 1500 board installed?
No
Yes
Define gatekeeper HG 1500.
Open V4.0 CDB using HiPath 3000 Manager E.
Open V4.0 CDB using HiPath 3000 Manager E.

Figure 9-16 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 1 of 4)

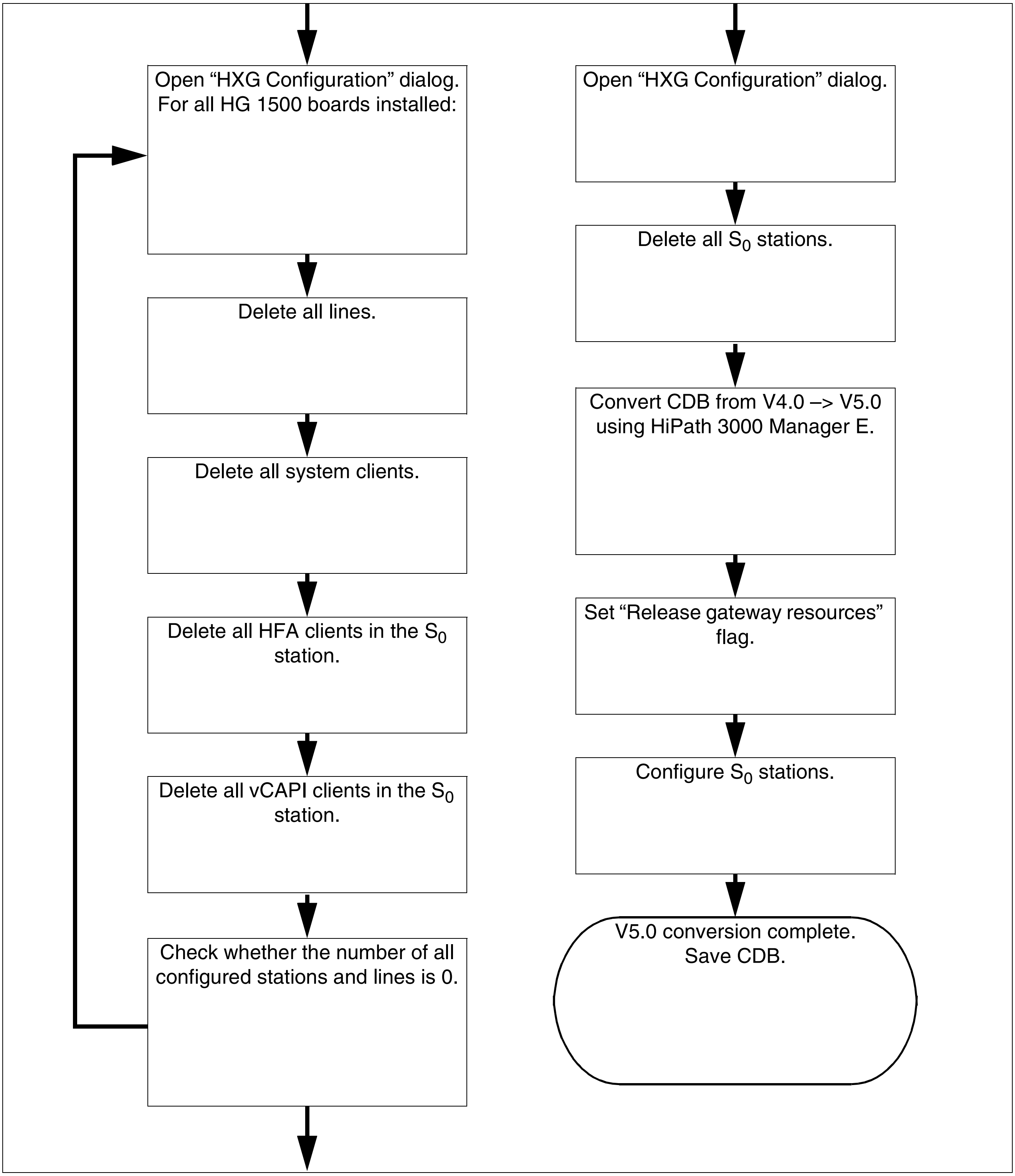

Open “HXG Configuration” dialog. For all HG 1500 boards installed:
Delete all lines.
Delete all system clients.
Delete all HFA clients in the S_0 station.
Delete all vCAPI clients in the S_0 station.
Check whether the number of all configured stations and lines is 0.
Open “HXG Configuration” dialog.
Delete all S_0 stations.
Convert CDB from V4.0 –> V5.0 using HiPath 3000 Manager E.
Set “Release gateway resources” flag.
Configure S_0 stations.
V5.0 conversion complete. Save CDB.

Figure 9-17 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 2 of 4)

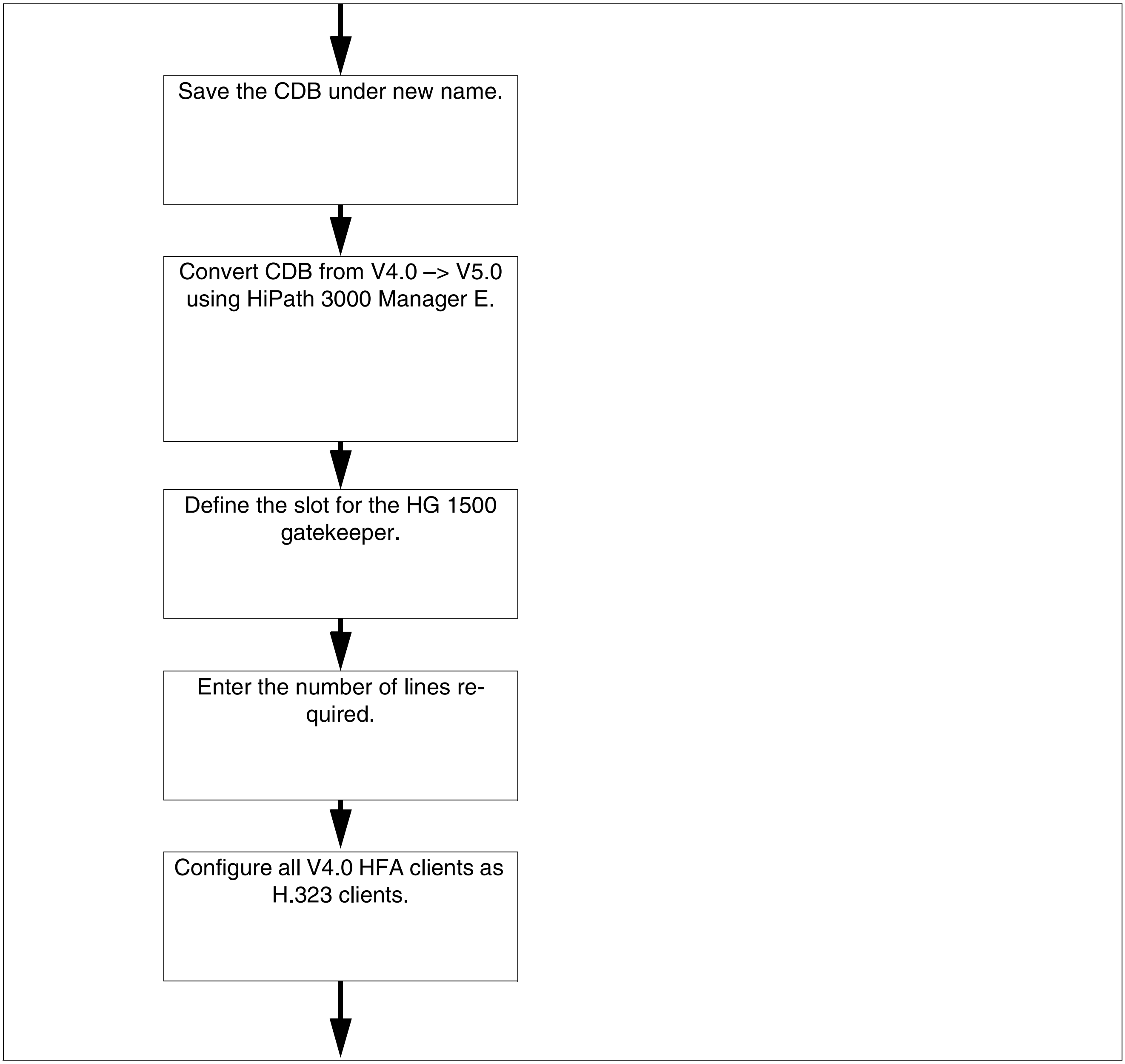

Save the CDB under new name.
Convert CDB from V4.0 –> V5.0 using HiPath 3000 Manager E.
Define the slot for the HG 1500 gatekeeper.
Enter the number of lines required.
Configure all V4.0 HFA clients as H.323 clients.

Figure 9-18 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 3 of 4)

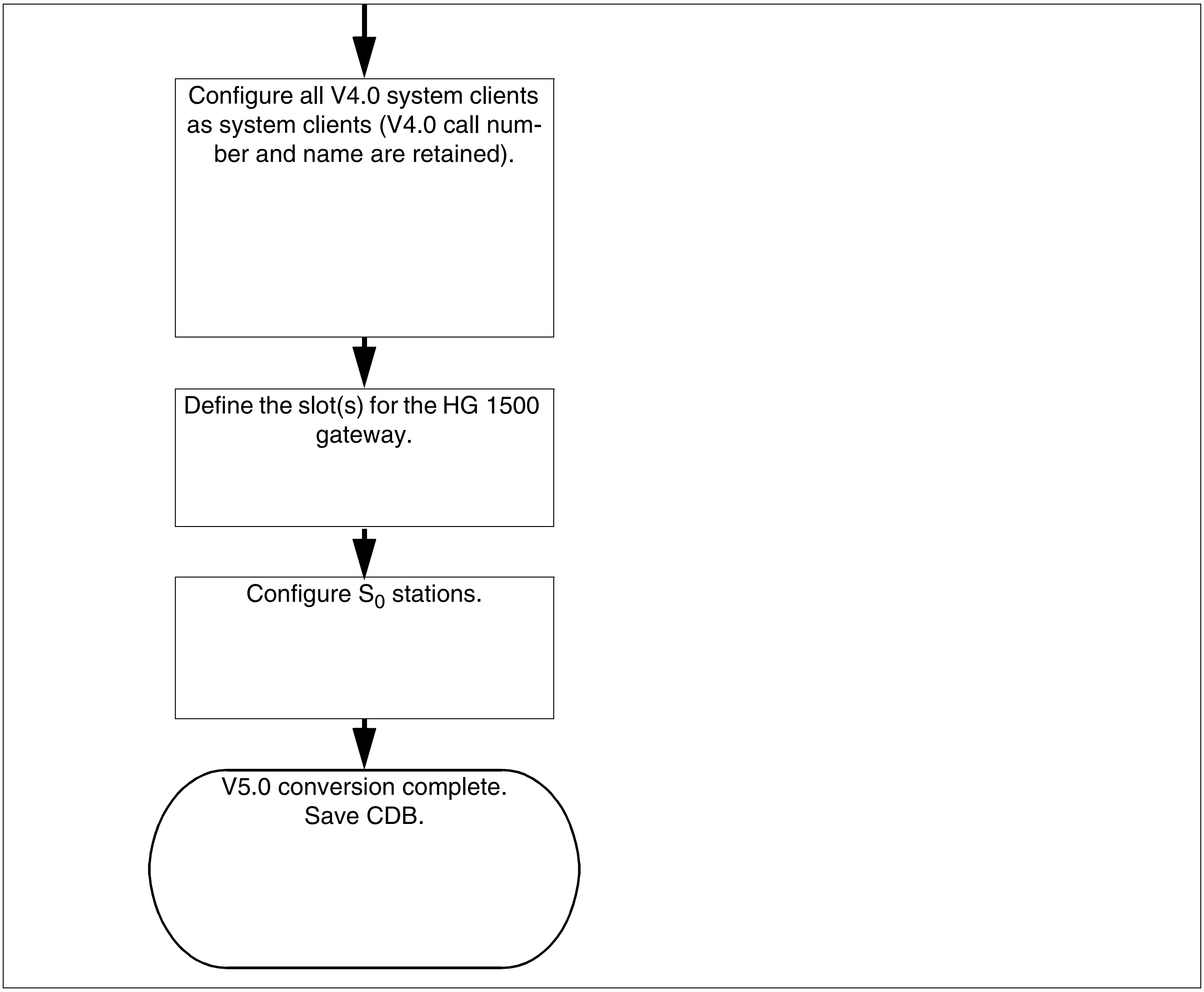

Configure all V4.0 system clients as system clients (V4.0 call number and name are retained).
Define the slot(s) for the HG 1500 gateway.
Configure S_0 stations.
V5.0 conversion complete. Save CDB.

Figure 9-19 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 4 of 4)

10 Workpoint Clients

10.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
optiPoint 500, page 10-3
● optiPoint 500 Telephones, page 10-5 – optiPoint 500 entry – optiPoint 500 economy (not for U.S.) – optiPoint 500 basic – optiPoint 500 standard, optiPoint 500 standard SL (For U.S. Only) – optiPoint 500 advance – Connection Requirements for HiPath 3000 – Connection – Connections on the Bottom of the Telephone – USB 1.1 Interface
● optiPoint 500 Add-On Devices, page 10-16 – optiPoint Key Module – optiPoint BLF – Programming Add-On Devices – Possible Configurations for the Add-On Devices
● optiPoint 500 Adapters, page 10-20 – optiPoint Analog Adapter – optiPoint ISDN Adapter – optiPoint Phone Adapter – optiPoint Acoustic Adapter – optiPoint Recorder Adapter – Possible optiPoint Adapter Configurations – Comparison of optiset E adapters and optiPoint 500 adapters
● Maximum Configuration for UP0/E Workpoint Clients, Add-On Devices and Adapters, page 10-31
optiPoint 600 office, page 10-33
optiLog 4me, page 10-36
optiset E Privacy Module, page 10-37

Topic
IP Telephony (Voice over IP), page 10-38
● optiPoint 410 and optiPoint 420, page 10-40 – optiPoint 410 Telephones – optiPoint 420 Telephones – optiPoint 410 and optiPoint 420 Add-On Devices – Use of optiPoint 500 Adapters
● optiClient 130 V5.0, page 10-64
● HiPath AP 1120, page 10-65
● HG 1500: Determining the Number of HG 1500 Boards Required, page 10-66 – Static Configuration Rules – Dynamic Configuration Rules – Determining the Number of HG 1500 Boards Required – Sample Calculation – Notes on the Maintenance of Gateway Channels HiPath 3000/5000 V5.0 or later
optiPoint Accessories, page 10-87
● External AC Adapters, page 10-87
● Headsets, page 10-90
Attendant console versions, page 10-92
● optiPoint Attendant, page 10-92
● optiClient Attendant, page 10-93
Mobile Telephones for HiPath Cordless Office, page 10-98
● Gigaset S1 professional, page 10-98
● Gigaset SL1 professional, page 10-99
● Gigaset M1 professional, page 10-100
● Gigaset active M, page 10-101
● Gigaset active EX, page 10-102
● Logging Mobile Telephones On To the System, page 10-104
Analog Telephones for HiPath 3000, page 10-107
ISDN Terminals for HiPath 3000, page 10-108

10.2 optiPoint 500

The optiPoint 500 telephones described in this section are compatible with the optiset E telephones. It is possible to operate both telephone families on one $U_{P0/E}$ board. You can also use telephones from the two families in mixed host-client configurations (earlier called the master-slave or primary-secondary configuration). You can find information on optiset E telephones, adapters, and add-on devices in the Hicom 150 H V1.0/Hicom 150 E Office Rel.2.0-3.0 Service Manual (refer to Section 1.6, “Information on the Intranet”): Electronic Documentation on Com ESY Products).

Introduction

optiPoint 500 telephones handle the digital communication of voice and data (voice communication only for optiPoint 500 entry and optiPoint 500 economy). The three dialog keys and the display guarantee convenient and interactive operation. Furthermore, the key lamp principle visualizes the activated functions.

With the exception of optiPoint 500 entry and optiPoint 500 economy, the optiPoint 500 telephones have a USB 1.1 interface. This allows for PC-supported telephoning and Internet access over the USB interface of a PC.

The optiPoint key module and optiPoint BLF add-on devices increase the number of function keys available.

The different optiPoint 500 adapters allow flexible expansion of the telephone workstation. Additional devices (such as personal computers, fax equipment, telephones, headsets) can be connected quickly because it is easy to build them on to the bottom of the telephones (not optiPoint 500 entry and optiPoint 500 economy) and because the adapters are plug "n" play".

You can find information not contained in this chapter in the optiPoint 500 Service Manual.

Key programming

Double key assignment
The programmable function keys of the optiPoint 500 telephones and the optiPoint key modules can have double assignments if only call numbers without LED support are saved on the first level. It is also possible to program call numbers without LED support on the second level. These can be internal station numbers, DID call numbers and call numbers from a HiPath network.
When the Shift function is pressed, the LED associated with the Shift key lights up. This signals that the phone numbers on the second key level are available. The Shift function is deactivated after 5 s or after you press a phone number or if you press the Shift key again.
The optiPoint BLF function keys cannot have double assignments.

You can label the keys in one of the following ways:

- by hand (in writing); label sheets come with each telephone.
- using a PC:
  - with the "Key Labeling Tool" (requires MS Word©) that is on the CD "Electronic Operating Instructions" (refer to Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).
  - with the “Online Key Labeling Tool” that can be downloaded from http://www.siemens.com/hipath (–> Downloads).

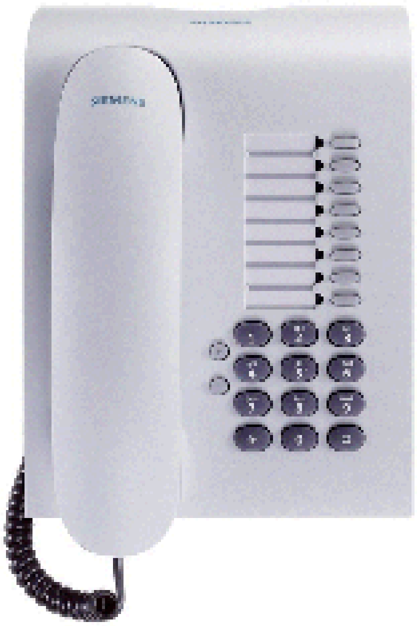
10.2.1 optiPoint 500 Telephones

10.2.1.1 optiPoint 500 entry

Main features

- 8 function keys (can be modified with HiPath 3000 Manager E) with LEDs (see Page 10-4)
- Open listening
- 2 volume adjustment keys (plus/minus) and pitch
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or add-on devices), no display

Standard key assignment (default) for optiPoint 500 entry



Consultation hold
Number redial
Message
Callback
Speed dialing
Microphone on/off
Loudspeaker
Disconnect

Figure 10-1 optiPoint 500 entry - Standard Key Assignment (Default)

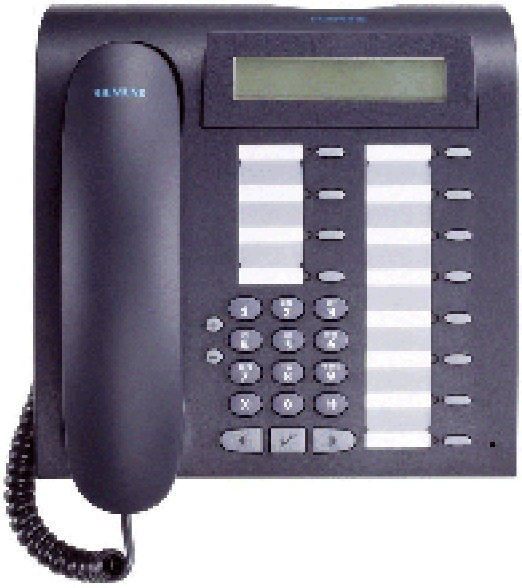
Refer to Section 10.2.1.6 for connection requirements.

10.2.1.2 optiPoint 500 economy (not for U.S.)

Main features

- 12 function keys (4 can be changed using HiPath 3000 Manager E, 8 freely programmable) with LEDs (see Page 10-4)
- Alphanumeric LCD swivel display with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or add-on devices)

Standard key assignment (default) for optiPoint 500 economy



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-2 optiPoint 500 economy (not for U.S.) - Standard Key Assignment (Default)

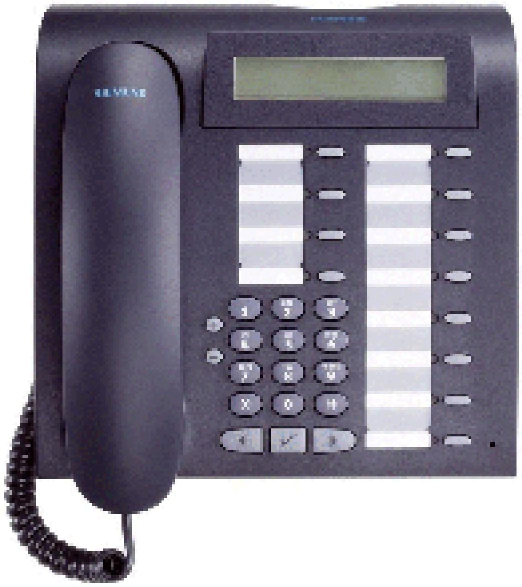
Refer to Section 10.2.1.6 for connection requirements.

10.2.1.3 optiPoint 500 basic

Main features

- 12 function keys (4 can be changed using HiPath 3000 Manager E, 8 freely programmable) with LEDs (see Page 10-4)
- Alphanumeric LCD swivel display with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Interfaces and slots:
  - 1 USB 1.1 interface
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 500 basic



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-3 optiPoint 500 basic - Standard Key Assignment (Default)

Refer to Section 10.2.1.6 for connection requirements.

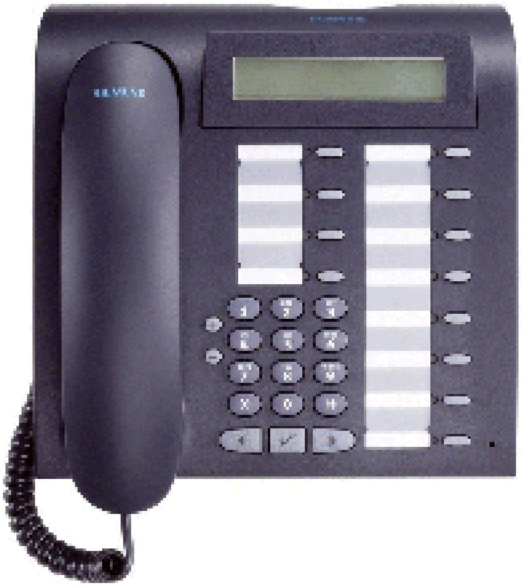
10.2.1.4 optiPoint 500 standard, optiPoint 500 standard SL (For U.S. Only)

Note: optiPoint 500 standard and optiPoint 500 standard SL (for U.S. only) function exactly the same on HiPath 3000 systems.

Main features

- 12 function keys (4 can be changed using HiPath 3000 Manager E, 8 freely programmable) with LEDs (see Page 10-4)
- Alphanumeric LCD swivel display with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Interfaces and slots:
  - 1 integrated USB 1.1 interface
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 500 standard



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-4 optiPoint 500 standard - Standard Key Assignment (Default)

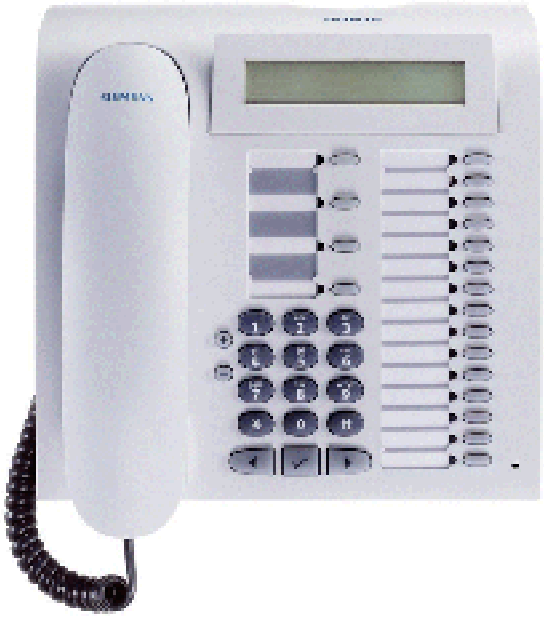
Refer to Section 10.2.1.6 for connection requirements.

10.2.1.5 optiPoint 500 advance

Main features

- 19 function keys (4 can be changed using HiPath 3000 Manager E, 15 freely programmable) with LEDs (see Page 10-4)
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each. Background lighting that stays lit for approximately 5 s.
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Interfaces and slots:
  - 1 integrated USB 1.1 interface
  - 2 option bays
  - 1 interface for up to 2 add-on devices
  - 1 headset port (121 TR9-5)
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 500 advance



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-5 optiPoint 500 advance - Standard Key Assignment (Default)

Refer to Section 10.2.1.6 for connection requirements.

10.2.1.6 Connection Requirements for HiPath 3000

Hardware requirements

System	HiPath 3800	HiPath 3750 HiPath 3700	HiPath 3550 HiPath 3500	HiPath 3350 HiPath 3300
Hardware requirements	free $U_{P0/E}$ port on SLMO2/8	free $U_{P0/E}$ port on SLMO8/24	free $U_{P0/E}$ port on CBCC CBRC SLU8 SLU8R SLMO24	free $U_{P0/E}$ port on CBCC CBRC SLU8 SLU8R

Refer to Section 9.2.2 for information on upgrading peripheral boards for HiPath 3750 and HiPath 3700.

Connecting as a client telephone

The device can also be connected to an existing optiPoint 500 telephone (except for optiPoint 500 entry and optiPoint 500 economy) as a client telephone (using an optiPoint Phone Adapter).

10.2.1.7 Connection

Procedure: Connecting an optiPoint 500 Telephone

Step	Activity
1.	Locate a free interface on the main distribution frame or internal distributor for connecting the telephone.
2.	Connect the cable from the main distribution frame or internal distributor to the wall outlet.

The maximum range for a standalone or host telephone without additional local power supply is approximately 1000 m (3280 feet) (for J-Y (ST) 2x2x0.6, ∅ 0.6 mm). Perform the terminal test in Section 12.3.1.8 to determine whether a local power supply is needed for additional power (for example, in host-client configurations or for larger ranges).

3.	Label the keys. You have the following options: ● by hand (in writing); label sheets come with each telephone. ● using a PC: – with the “Key Labeling Tool” (requires MS Word©) which is contained on the “Electronic Operating Instructions” CD. – with the “Online Key Labeling Tool” which can be downloaded from http://www.siemens.com/hipath (–> Downloads).
4.	Prepare the telephone for connection: ● Connect the handset cord to the telephone (marked with symbol) and to the handset. ● Do you plan to connect an add-on device? Refer to Section 10.2.2 on page 10-16 for more information. ● Do you plan to connect an optiPoint adapter? Refer to Section 10.2.3 on page 10-20 for more information.
5.	Connect the line cord (marked on the telephone by a symbol). optiPoint 500 telephones are shipped with a 6 m (20 ft.) line cord and an MW6 (RJ11) plug for connection to a modular telephone jack.

The first time the telephone is switched on,

- all LEDs light up briefly
- all LEDs on the add-on devices (AODs), if connected, light up briefly (AOD LEDs do not necessarily flash at the same time as the LEDs on the telephone)
- all pixels on the display activate briefly.

These indications show that the telephone is starting up and performing a self-test. Downloading has finished and the telephone is ready for operation when you see the date and time on the display.

10.2.1.8 Connections on the Bottom of the Telephone

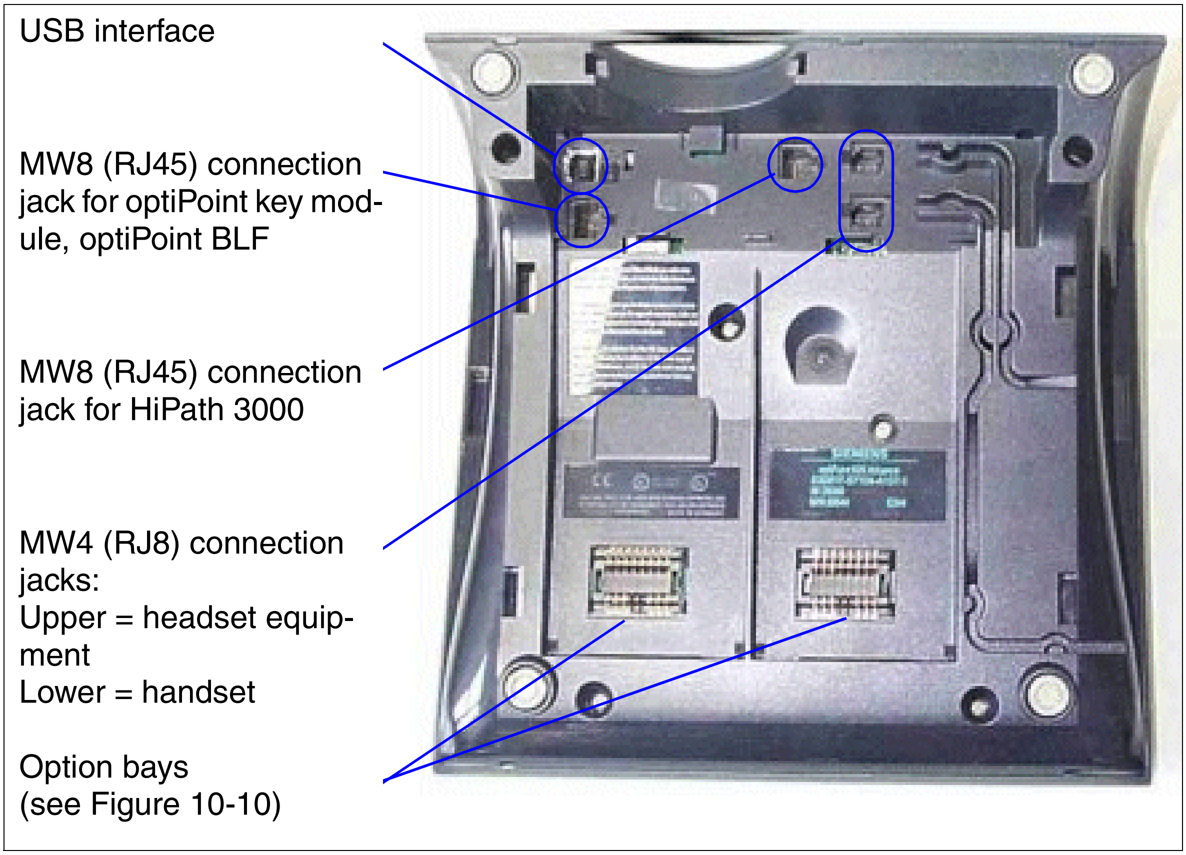

USB interface
MW8 (RJ45) connection jack for optiPoint key module, optiPoint BLF
MW8 (RJ45) connection jack for HiPath 3000
MW4 (RJ8) connection jacks:
Upper = headset equipment
Lower = handset
Option bays
(see Figure 10-10)

Figure 10-6 optiPoint 500 Connection Options

10.2.1.9 USB 1.1 Interface

With the exception of optiPoint 500 entry and optiPoint 500 economy, the optiPoint 500 telephones have a USB 1.1 interface. This forms the basis for:

- PC-supported telephoning (TAPI)
- Data transmission over CAPI (for example, direct Internet access, fax capability, e-mail, etc.). If the CAPI software is installed, PCs have direct Internet access over the USB interface without any additional adapter. There is a charge for this software.

TAPI and CAPI can be used simultaneously (for example, to receive a large e-mail or download data while calls are being set up over a CTI application).

> optiClient Attendant - the professional PC attendant console is connected over the USB 1.1 interface of the optiPoint 500 basic, optiPoint 500 standard or optiPoint 500 advance.

10.2.2 optiPoint 500 Add-On Devices

The optiPoint key module and optiPoint BLF add-on devices increase the number of function keys available.

The user usually installs the add-on devices. The installation instructions are on the “Electronic Operating Instructions” CD.

> ⚠ **Caution**
> Always disconnect the line cord before connecting add-on devices to the telephone.

Refer to the HiPath 3000/5000 Feature Description for model-specific data for the optiPoint key module and the optiPoint BLF.

10.2.2.1 optiPoint Key Module

The optiPoint key module is an add-on device that should be mounted on the side of the telephone; it provides an additional 16 keys, LEDs and labelling areas for all purposes. Figure 10-9 shows the possible configurations.

Double assignment can be performed for the keys if only call numbers without LED support are saved on the first level. It is also possible to program call numbers without LED support on the second level. These can be internal station numbers, DID call numbers and call numbers from a HiPath network (see also Page 10-4).

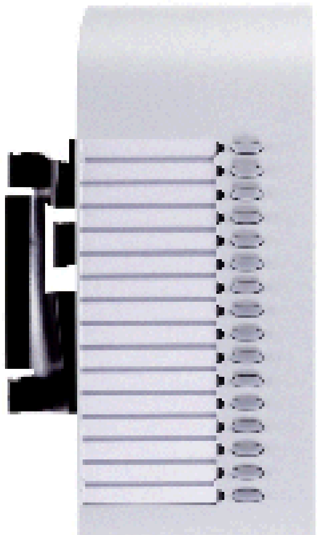


Figure 10-7 optiPoint Key Module

10.2.2.2 optiPoint BLF

This is an add-on device that provides 90 additional keys, LEDs and labeling areas for all purposes.

The device is connected to the telephone or to an optiPoint key module over an interface cable with the following connectors: input MW6, output MW8. Figure 10-9 shows the possible configurations.

Power is supplied using a power supply unit (see Section 10.7.1.1) that can supply power to up to two optiPoint BLFs. The power supply unit must be plugged directly into the designated optiPoint BLF port.

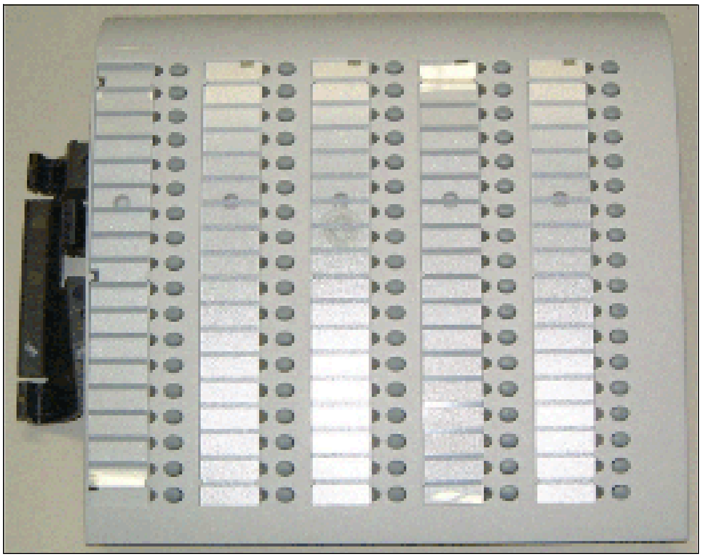


Figure 10-8 optiPoint BLF

10.2.2.3 Programming Add-On Devices

An inserted add-on device automatically registers with the system and is then ready for operation. Keys can be programmed via HiPath 3000 Manager E or the respective telephone set. If you replace the device, the information programmed under the keys is maintained (stored in the customer database).

If a configuration other than the one shown in Figure 10-9 is used, the LEDs and keys may not function correctly. You must update the database with HiPath 3000 Manager E.

Example: You replace configuration E by configuration B. You must use HiPath 3000 Manager E to remove the optiPoint key module 2 from the database so that the LEDs and keys function correctly.
You can also use optiPoint BLF to delete Assistant Ts and optiPoint key modules.

The first optiPoint BLF that is initially connected to HiPath 3750, HiPath 3550, HiPath 3700, or HiPath 3500 automatically receives standard key assignments (default) for the first 90 system ports. No standard assignment is made if you already configured an optiPoint BLF with HiPath 3000 Manager E or if other optiPoint BLFs are connected.

Replacing an optiPoint key module with an optiPoint BLF

Procedure:

Step	Activity
1.	Unplug the connection cable between the optiPoint key module and the telephone (or other optiPoint key module). Remove optiPoint key module.
2.	Remove optiPoint key module from the database using HiPath 3000 Manager E.
3.	Plug in the optiPoint BLF. HiPath 3000 Manager E automatically detects the BLF and enters it in the database.

10.2.2.4 Possible Configurations for the Add-On Devices

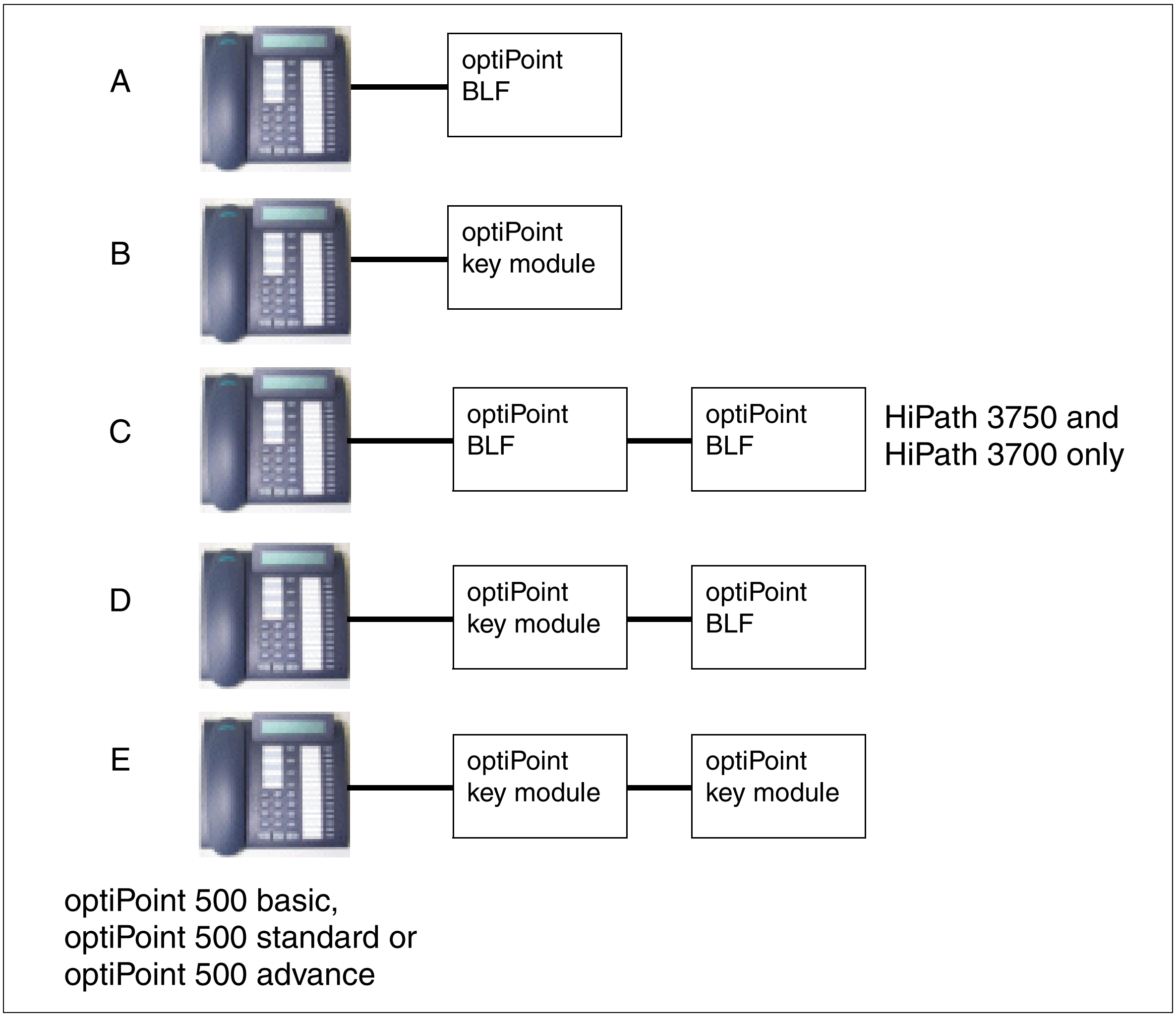

A
optiPoint BLF
B
optiPoint key module
C
optiPoint BLF
optiPoint BLF
HiPath 3750 and HiPath 3700 only
D
optiPoint key module
optiPoint BLF
E
optiPoint key module
optiPoint key module
optiPoint 500 basic, optiPoint 500 standard or optiPoint 500 advance

Figure 10-9 optiPoint 500 Possible Configurations for Key Modules

10.2.3 optiPoint 500 Adapters

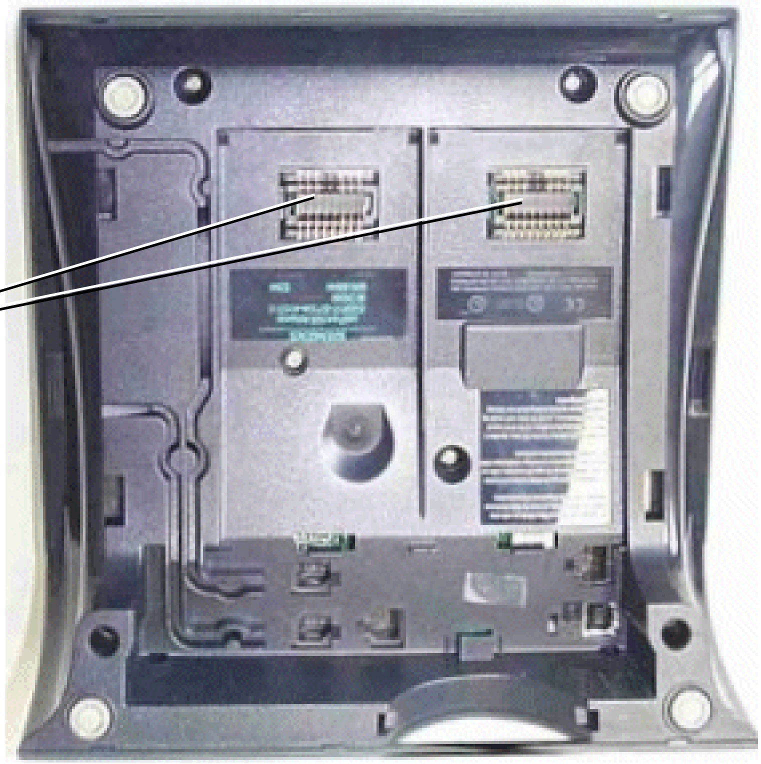
The different optiPoint 500 adapters (not optiPoint 500 entry and optiPoint 500 economy) allow flexible expansion of the telephone workstation by providing additional device connections (such as personal computers, fax equipment, telephones, headsets).

The adapters, which are connected on the bottom of the telephone, are plug "n" play". When a new telephone adapter configuration is plugged in, it generates a reset; a setup message notifies the system of the new configuration.

The user usually installs the adapter. The installation instructions are on the “Electronic Operating Instructions” CD.

> ⚠ **Caution**
> Always disconnect the line cord before connecting adapters to the telephone or removing them from the telephone.

Option bays



Option bays:
- 2 x for optiPoint 500 advance (shown here)
- 1 x for optiPoint 500 basic and optiPoint 500 standard

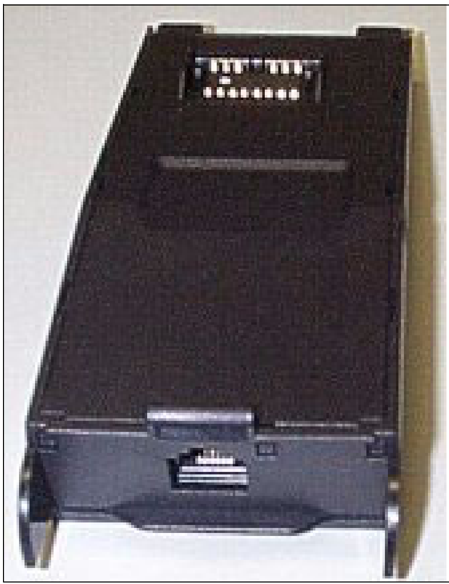
Figure 10-10 optiPoint 500 Option Bays

10.2.3.1 optiPoint Analog Adapter

The optiPoint analog adapter allows an analog device (such as, telephone (DTMF only), group 3 fax, modem, cordless telephone) to be connected to an optiPoint 500 telephone.

The connected analog device can send and receive calls on the interface to the system regardless of the connection status of the optiPoint telephone, as long as a B channel is available.

The adapter must always have a local power supply for operating the connected analog device.



MW6 (RJ11) socket assignments:

Pin	Signal
1	Free
2	Free
3	T (Tip)
4	R (Ring)
5	Free
6	Free

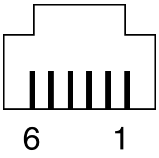


Figure 10-11 optiPoint Analog Adapter

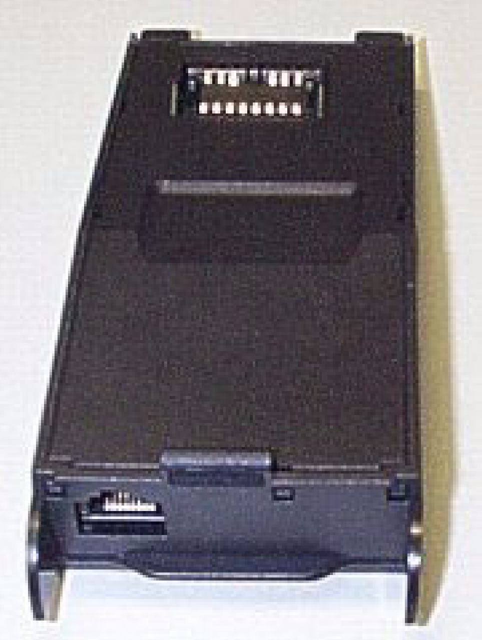
T/R interface properties

- Supply current: 30 mA
- Busy signal when both B channels are busy
- Ring sequence: 2.2
- Supports only DTMF with Flash
- No ground signaling allowed
- Does not support: VoiceMail server with T/R interface, message waiting lamp, dictating equipment, speaker, announcement device (such as start/stop).

10.2.3.2 optiPoint ISDN Adapter

The optiPoint ISDN adapter provides the basic ISDN access for S_0 devices (max. 2), such as S_0 PC card, group 4 fax equipment, or video communication devices (such as videoset or videokit, etc.).

S_0 telephones must have their own power supply for connection.



MW8 (RJ45) socket assignments:

Pin	Signal
1	Free
2	Free
3	SR1
4	SX1
5	SX2
6	SR2
7	Free
8	Free

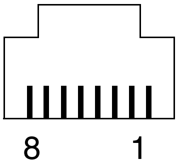


Figure 10-12 optiPoint ISDN Adapter

S_0 interface properties

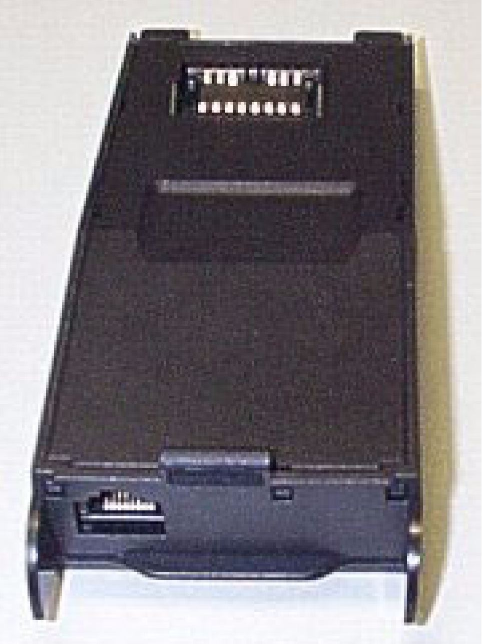
- Supports point-to-point and passive bus connections
- Wired for short passive bus configurations
- Cable lengths
  - Maximum 100 m (328 feet) with a cable impedance of 75 ohms
  - Maximum 200 m (656 feet) with a cable impedance of 150 ohms (complies with CCITT recommendation I.430)
- The NT terminating resistors are integrated into the ISDN adapter.

10.2.3.3 optiPoint Phone Adapter

The optiPoint phone adapter is used for connecting a second optiPoint 500 telephone (client telephone) with its own power supply.

The system treats the client telephone as an independent telephone with a separate phone number and its own B channel. The client telephone can send and receive calls regardless of the connection status of the host telephone.

The maximum range between the host and client telephones is approximately 100 m (328 feet) (for J-Y (ST) 2x2x0.6, ∅ 0.6 mm).



MW6 (RJ11) socket assignments:

Pin	Signal
1	Free
2	AUX – (a)
3	$U_{P0/E}$ –
4	$U_{P0/E}$ +
5	AUX + (b)
6	Free

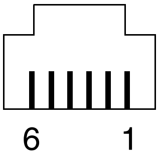


Figure 10-13 optiPoint Phone Adapter

Example of a host-client configuration

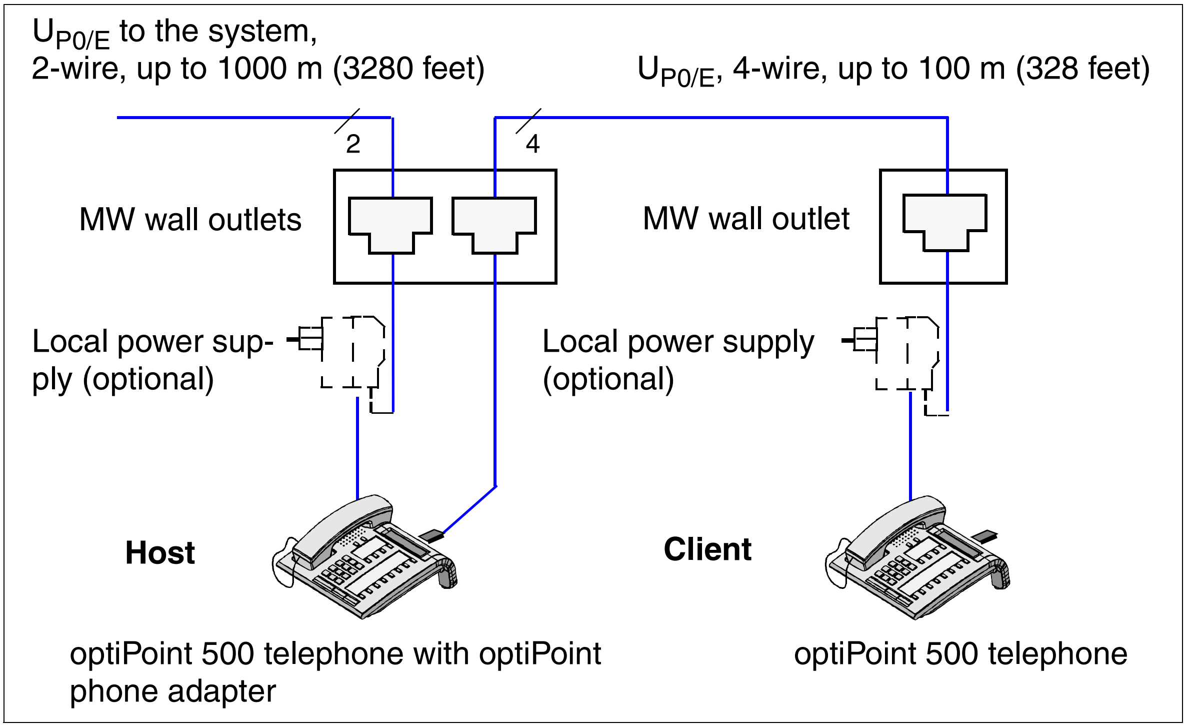
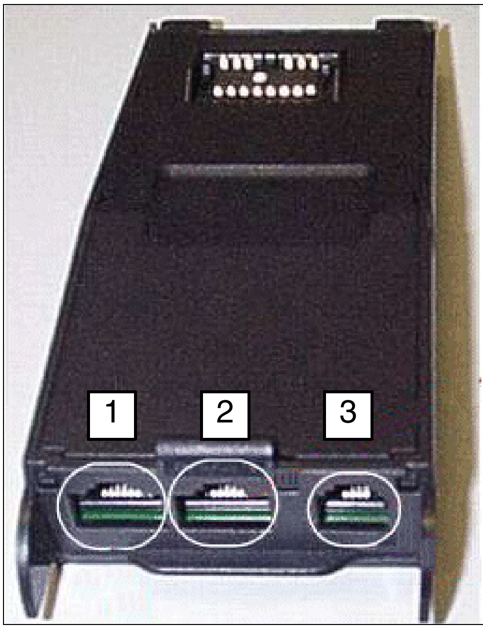

$U_{P0/E}$ to the system,
2-wire, up to 1000 m (3280 feet)
$U_{P0/E}$, 4-wire, up to 100 m (328 feet)
2
4
MW wall outlets
MW wall outlet
Local power sup-ply (optional)
Local power supply (optional)
Host
Client
optiPoint 500 telephone with optiPoint phone adapter
optiPoint 500 telephone

Figure 10-14 Example of a Host-Client Configuration

10.2.3.4 optiPoint Acoustic Adapter

The optiPoint acoustic adapter is used for connecting

- a headset (121 TR 9-5) (see Section 10.7.2)
- an active loudspeaker box and a desk microphone via the Y cable
- busy display/door opener and secondary bell/light paging, etc. (each with its own power supply) via floating contacts (not supported when using the adapter on optiPoint 410 and optiPoint 420).



Assignment of the three connection jacks:

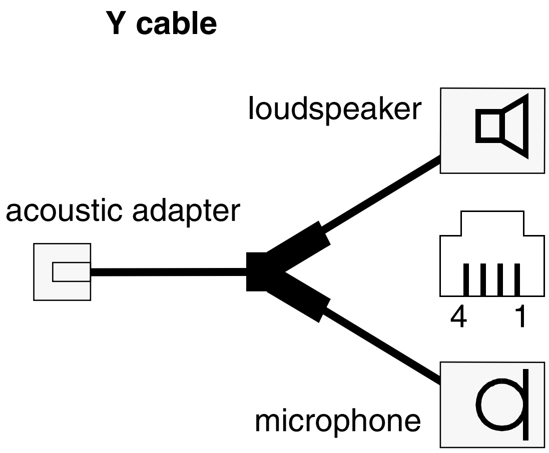
1	Connecting a headset with the following electrical values (121 TR 9-5): ● Microphone (electret interface): – max. power: 400 µA, – supply voltage: 5 V ± 10% – series resistor: 5 kΩ ± 10% ● Acoustic transformer: – Impedance: 150 Ω ± 10% – EBD: 13 dB ± 2.5 dB
2	Connecting a loudspeaker and microphone using Y cable (see Figure 10-16)
3	Floating contacts (see Table 10-1), load capacity of max. 5 W at 24 Vac or 60 Vdc

Figure 10-15 optiPoint Acoustic Adapter

Notes on the optiPoint acoustic adapter

- The internal components of the optiPoint terminal are deactivated in speakerphone mode if an external microphone and an external loudspeaker are used (sense lead).
- optiPoint 500 basic does not support the connection of an external microphone to the optiPoint acoustic adapter.
- The speakerphone mode selection is independent of whether the internal or an external speakerphone is used. External speakerphones have precedence over internal speakerphones with the exception of manual intercom and signaling procedures.
- The internal microphone, the transmitter inset and any microphone connected to the optiPoint acoustic adapter are muted in the “Mute” audio state.
- Ring, alarm and key tones are transferred to the internal loudspeaker and not to an external loudspeaker connected to the optiPoint acoustic adapter.

- The volume keys on the optiPoint terminal are used to adjust the volume level of the internal loudspeaker and any connected external loudspeaker. The volume of the external loudspeaker can also be adjusted using the external amplifier.



Assignment of the MW4 connection sockets:

Pin	Signal
1	sense lead
2	NF+
3	Free
4	GND

Internal resistance: 0 Ω; 10 µF
Level (for PCM -20 dBm): -4.8 dBm (at volume level 8; 0.775 V = 0 dBm)
Sense lead to GND: int. loudspeaker deactivated; only active for tone ringing.

Pin	Signal
1	+5V
2	GND
3	Free
4	sense lead

Input level -50 dBm: -12 dBm PCM signal
Input resistance: 150 kΩ parallel to 220 nF in series with 36 kΩ
Sense lead to GND: internal microphone deactivated.

Figure 10-16 Y Cable for optiPoint acoustic adapter

Table 10-1 Floating contacts on the optiPoint acoustic adapter

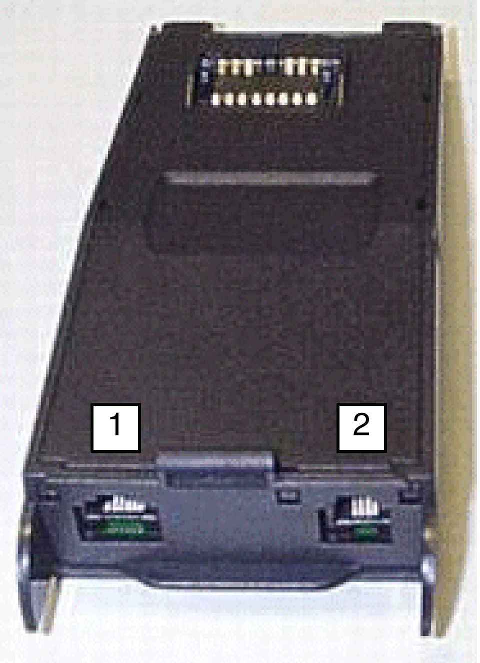
Pin	Assign-ment	Notes
1	Free	–
2 3	"Busy" contact	Signals active telephone states: ● handset lifted ● Loudspeaker activated or headset active These states can be displayed, for example, on external signaling equipment (LED, relay, etc.) The signaling equipment must have its own power supply. The contact can be loaded with up to 5 W at 24 Vac or 60 Vdc.

Table 10-1 Floating contacts on the optiPoint acoustic adapter

Pin	**Assignment**	**Notes**
4	"Call" contact	Signals the call receipt state. This can be used, for example, to control a secondary bell. The contact can be loaded with up to 5 W at 24 Vac or 60 Vdc.
5		
6	Free	–

10.2.3.5 optiPoint Recorder Adapter

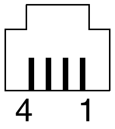
The optiPoint recorder adapter allows an external recorder or a second headset to be connected. The called party must be informed that the call is being recorded.



Assignment of both connection jacks:

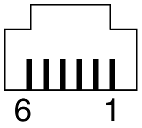
1 MW4 port for second headset

Pin	Signal
1	Tx–
2	Rx
3	Rx
4	Tx+



2 MW6 port for recorder

Pin	Signal
1	Free
2	NF
3	NF
4	NF
5	NF
6	Free
Contacts 2+3 and 4+5 are bridged internally.	



Recorders to be connected must meet the following electrical requirements:
Input impedance: >10 kΩ
Frequency progression: 300 to 3000 Hz ± 3 dB
Beep tone level: -26 dBm to -18 dBm at a 600 Ω load
Max. input level: 650 mVeff from a 600 Ω source

Figure 10-17 optiPoint Recorder Adapter

10.2.3.6 Possible optiPoint Adapter Configurations

Adapter categories

Each $U_{P0/E}$ port in the system provides two B channels. This means that you can connect two telephones, each with a separate phone number, to one $U_{P0/E}$ port.

Category 1 optiPoint 500 adapters
The following adapters each require a B channel and, therefore, can only be used once on a host terminal (host terminal requires the second B channel of the $U_{P0/E}$port).

- optiPoint Analog Adapter
- optiPoint ISDN Adapter
- optiPoint Phone Adapter

If one of these adapters is used in the optiPoint 500 advance, only a category 2 adapter can be operated in the second slot.

Category 2 optiPoint 500 adapters
The following adapters can be used on the host and client telephones. This is also true if a category 1 optiPoint 500 adapter is already connected.

- optiPoint Acoustic Adapter
- optiPoint Recorder Adapter

Configuration restrictions

> The voltage feed test can be used to check whether a local power supply is also necessary for an adapter configuration. To avoid any doubts, the test should always be implemented when installing large configurations.

Number of usable adapters and add-on devices

Section 10.2.4 shows the maximum number of adapters and add-on devices that can be connected to HiPath 3000/5000. The limits also include the client telephones connected over optiPoint phone adapters and the analog telephones connected over optiPoint analog adapters.

10.2.3.7 Comparison of optiset E adapters and optiPoint 500 adapters

Table 10-2 Comparison of optiset E and optiPoint 500 adapters

optiset E		optiPoint 500
analog adapter	→	analog adapter
phone adapter	→	phone adapter
data adapter	→	integrated USB interface
control adapter		
ISDN adapter	→	ISDN adapter
acoustic adapter	→	acoustic adapter
contact adapter		
headset adapter		
headset plus adapter	→	recorder adapter

10.2.4 Maximum Configuration for $U_{P0/E}$ Workpoint Clients, Add-On Devices and Adapters

Table 10-3 System-Specific Maximum Configuration for $U_{P0/E}$ Workpoint Clients, Add-On Devices, and Adapters

Workpoint Clients, Add-On Devices, Adapters	**SYSTEM**					
	HiPath 3800[1]	**HiPath 3750 HiPath 3700**	**HiPath 3550**	**HiPath 3500**	**HiPath 3350**	**HiPath 3300**
optiPoint 500 telephones						
- Number per system	384	250/384[2]	72[3]	48[4]	24[5]	24[6]
- Number per box (the value in brackets applies to operation using a PSUI)	192	144 (120)	–	–	–	–
optiPoint acoustic adapters						
Number per system	No restriction					
optiPoint analog adapters						
Number per system	116	116[7]	24[8]	24[8]	8[9]	8[9]
optiPoint recorder adapters						
Number per system	No restriction					
optiPoint ISDN adapters						
Number per system	116	116[7]	48[8]	48[8]	8[9]	8[9]
optiPoint phone adapters						
Number per system	116	116[7]	48[8]	48[8]	24[9]	24[9]
optiPoint key modules						
Number per system	100	100	100	100	30	30
optiPoint BLF:						
Number per system	12	12	6	6	–	–
optiset E telephones						
- Number per system	384	250/384[2]	72[3]	48[4]	24[5]	24[6]
- Number per box (the value in brackets applies to operation using a PSUI)	192	144 (120)	–	–	–	–

Table 10-3 System-Specific Maximum Configuration for $U_{P0/E}$ Workpoint Clients, Add-On Devices, and Adapters

Workpoint Clients, Add-On Devices, Adapters	SYSTEM					
	HiPath 3800[1]	HiPath 3750 HiPath 3700	HiPath 3550	HiPath 3500	HiPath 3350	HiPath 3300
optiset E analog adapters						
Number per system	116	116[7]	24[8]	24[8]	8[9]	8[9]
optiset E control adapters						
Number per system	No restriction					
optiset E data adapters						
Number per system	50	50	48	48	16	16
optiset E speech adapters						
Number per system	No restriction					
optiset E privacy modules						
Number per system	No restriction					
optiset E ISDN adapters						
Number per system	116	116[7]	48[8]	48[8]	8[9]	8[9]
optiset E phone adapters						
Number per system	116	116[7]	48[8]	48[8]	24[9]	24[9]
optiset E key modules						
Number per system	100	100	100	100	30	30
optiset E BLFs						
Number per system	12	12	6	6	–	–

[1] Testing is not required on stations and lines up to the maximum configuration. Configurations that contain UCD/ACD or more than one SLCN or groups with more than 10 stations should always be checked using the project planning tool (intranet: http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index.htm).

[2] Depending on the system configuration and performance, the specified capacity limits may not always be achieved. To ensure that the dynamic capacity limit of HiPath 3750 or HiPath 3700 is not exceeded, the configuration can be tested using the project planning tool (intranet: http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index.htm). Testing is not required for configurations of up to 250 stations and 90 lines. Configurations that contain UCD/ACD or more than one SLC16/SLC16N or groups with more than ten stations should always be checked using the project planning tool.

[3] 8x$U_{P0/E}$ at the central board + 5xSLU8 + 1xSLMO24.

[4] 8x$U_{P0/E}$ at the central board + 5xSLU8R.

[5] 8x$U_{P0/E}$ at the central board + 2xSLU8.

[6] 8x$U_{P0/E}$ at the central board + 2xSLU8R.

[7] The total number of $U_{P0/E}$ stations and additional stations connected using an adapter is limited to 384.

[8] If the total number of $U_{P0/E}$ stations, analog stations and additional stations connected using an adapter is greater than 72, an external EPSU2 power supply unit must be used.

[9] If the total number of $U_{P0/E}$ stations and additional stations connected using an adapter is greater than 24, a UPSC-D/UPSC-DR must be used.

10.3 optiPoint 600 office

optiPoint 600 office is the first convergence telephone with $U_{P0/E}$ **and** IP interfaces (CorNet IP).

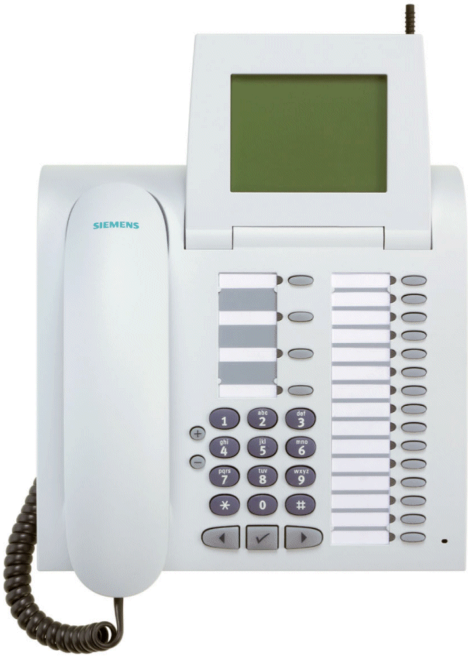
In $U_{P0/E}$ mode, it represents a high-end product that completes the optiPoint 500 family and supersedes optiset E memory.

In CorNet IP mode, it functions as a high-end IP phone in the optiPoint 400 family.

Main features

- 19 function keys (4 changeable using HiPath 3000 Manager E, 15 user-programmable) with LEDs
- Graphic LCD display (swivel) with 8 lines, each with 24 characters, touchscreen. Background lighting with approximately 5 s ghosting.
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Interfaces and slots:
  - 1 integrated USB 1.1 interface
  - 1 option bay
  - 1 interface for up to 2 add-on devices
  - 1 headset port (121 TR9-5)
- Suitable for wall mounting
- In $U_{P0/E}$ mode ($U_{P0/E}$ interface): SW download via PPP
- In CorNet IP mode (IP interface, 10/100BaseT): WAP access
  Supported standards: H.323, Hicom Feature Access, G.711, G.723.1, QoS, SNMP, HTTP, DHCP, FTP, LDAP (database access I/F)

Default key assignment for optiPoint 600 office



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-18 optiPoint 600 office - Default Key Assignment

Comparison of optiPoint 600 office and optiset E memory

Table 10-4 Comparison of optiPoint 600 office and optiset E memory

optiPoint 600 office	optiset E memory
Convergence product	optiPoint IP adapter needed for use in IP environments
19 function keys, no integrated keypad: external keypad possible over USB interface	12 function keys and integrated alphanumeric keypad
Full-duplex speakerphone mode	Half-duplex speakerphone mode
Integrated USB 1.1 interface	optiset E data adapter needed for data communication with a PC
Headset port	optiset E headset adapter needed for headset connection
Graphic LCD display with background lighting, touchscreen	LCD display without background lighting, no touchscreen
Supports card reader/writer	Supports card reader

Table 10-4 Comparison of optiPoint 600 office and optiset E memory

optiPoint 600 office	optiset E memory
Supports cordless adapter	–
Wide scope of functions with few adapters 1 option bay	Many adapters necessary for using functions 2 option bays

Connection and configuration

- Connection of optiPoint 600 office over the $U_{P0/E}$ interface: Refer to Page 10-13 for more information.
- Connection of optiPoint 600 office over the IP interface: You can obtain further information in the installation and startup instructions (http://www.siemens.com/hipath (–> Downloads)).
  Use HiPath 3000 Manager E to configure a workpoint client.

10.4 optiLog 4me

optiLog 4me is a digital, single-channel speech recording device designed for operation with the HiPath 3000/5000. It can record up to 2900 hours of telephone calls.

Figure 10-19 optiLog 4me

You can set the optiLog 4me to the following modes in both digital and analog telephones:

- Start Recorder
  Recording begins when you press the Start key.
- Trader Recorder
  Records and stores all calls.
- Malicious Call Recorder
  Stores calls in their entirety when you press any button during the call.
- Third Party Monitoring (not currently available with HiPath 3000/5000)
  optiLog 4me should be installed at the central station of the system. Recording starts when you press the Monitor key on the telephone.

Furthermore, you can use the recorder to record conference calls using an external microphone.

The optiLog 4me can be connected between the optiPoint 500 telephone and the handset. The privacy module is supplied complete with a local power supply.

For additional information on this, please refer to the installation and administration instructions included with the adapter.

10.5 optiset E Privacy Module

The optiset E privacy module protects telephone calls from unauthorized monitoring. Both partners need a device like this. The privacy module is connected between the telephone and handset; you simply need to plug in the handset cord. The privacy module is supplied complete with a local power supply.

> The optiset E privacy module may be subject to import and export regulations.

10.6 IP Telephony (Voice over IP)

Introduction

Voice over IP (VoIP) allows voice data to be transferred over IP networks. To guarantee communication between the IP telephones, they must have compatible IP communication stacks. H.323 is the universal standard that defines the framework for Voice over IP communication and, consequently, for the IP communication stack. Additional standards are implemented as well.

Gateways are required for communication between IP-supported networks (LAN, Intranet, Internet) and circuit-switched networks (ISDN, PSTN). A gateway is not required for “straightforward” Voice over IP communication.

The tasks performed by a gatekeeper include:

- registration of IP workpoint clients:
  - system clients, such as, optiClient 130 V5.0, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600 (CorNet IP mode)
  - H.323 clients, such as Microsoft Windows NetMeeting
- setup of a connection
- access control

Main features of version 5.0

Voice over IP (VoIP), that is, the transfer of voice data over IP networks, is enabled via the HG 1500 boards in HiPath 3000.

Version 5.0 incorporates H.323 **gatekeeper functions** in the HiPath 3000 communication system and in the HiPath ComScendo Service (on HiPath 5000). This means that each HiPath 3000 system with at least one HG 1500 card and each HiPath ComScendo Service forms a separate gatekeeper zone, to which the registered IP workpoint clients also belong.

H.323 communication between networked HiPath 3000 systems (nodes) is viewed as gatekeeper-gatekeeper communication. There is no registration between HG 1500 boards of networked systems. The CorNet NQ protocol, tunneled in H.323 via Annex M1, is used.

The **division of HG 1500 resources** into signaling and payload resources is a key feature in version 5.0.

- Signaling Resources
  These include all of the node-specific signaling data required for Voice over IP for IP-supported (LAN, Intranet, Internet) and circuit-switched networks (ISDN, PSTN). These resources are provided centrally by a single HG 1500 board, the signaling gateway (= gatekeeper HG 1500). The number of HG 1500 boards of the node is irrelevant. A HG 1500 board is defined as HG 1500 gatekeeper using HiPath 3000 Manager E.
- Payload Resources
  The node resources required for the gateway transfer (between IP-supported and circuit-switched networks) of VoIP voice data (payload) are provided by the media gateways (= gateway HG 1500). This can be one or more HG 1500 board(s).
  No payload resources are required for direct transfer between IP-supported networks. A HiPath 5000 with HiPath ComScendo Service can function as the VoIP system.

In systems with just one HG 1500 board, this board functions both as a signaling gateway and a media gateway. A "Release gateway resources" flag must be activated for this in HiPath 3000 Manager E. Otherwise no resources can be assigned.

In systems with multiple HG 1500 boards, the payload resources are controlled by the central node **Resource Manager**. This is a self-configuring service. The signaling resources are provided centrally by the first HG 1500 board. This signaling gateway also accesses other media gateway resources (CODECs, B channels) and signaling data (for example RTP, RTCP). This gives IP workpoint clients and other gateways access to central payload resources of all HG 1500 boards in a node.

Resources for functions which are not based on H.323 (for example, routing channels, vCAPI channels), are provided as before by each HG 1500 board. In systems with multiple HG 1500 boards, the resources are provided solely by the media gateways for performance reasons.

10.6.1 optiPoint 410 and optiPoint 420

Introduction

The IP telephones in the optiPoint 410 and optiPoint 420 families allow users to conduct telephone calls in the simple, familiar way over a data network.

All HiPath 3000/5000 features that are offered interactively on the display, in the service menu, and on function keys are available (except for Relocate).

The three dialog keys and the display guarantee convenient and interactive operation (not available for optiPoint 410 entry). Furthermore, the key lamp principle visualizes the activated functions.

The difference between the optiPoint 410 and optiPoint 420 families lies in the design of the function key panels:

- optiPoint 410 family: the function keys have panels with labeling strips on which the function or call number currently saved can be entered.
- optiPoint 420 family: the function keys are self-labeling keys. Self-labeling means that each key is assigned a display (1 line with 12 characters) in which the function or call number currently saved is shown.

The optiPoint SLK add-on device allows you to increase the number of function keys available (not applicable for optiPoint 410 entry, optiPoint 410 economy, optiPoint 420 economy and optiPoint 420 economy plus). The add-on devices optiPoint key module and optiPoint BLF can be used with the optiPoint 410 and optiPoint 420 families.

The optiPoint 410 display module is used as an add-on device for optiPoint 410 standard, optiPoint 410 advance, optiPoint 420 standard and optiPoint 420 advance. Its graphical LCD display (320 x 240 dots), the touchscreen and the navigation keys mean that many functions can be used intuitively and therefore more effectively.

The use of different optiPoint 500 adapters guarantees flexibility for the expansion of the telephone workstation (not optiPoint 410 entry, optiPoint 410 economy, optiPoint 420 economy and optiPoint 420 economy plus).

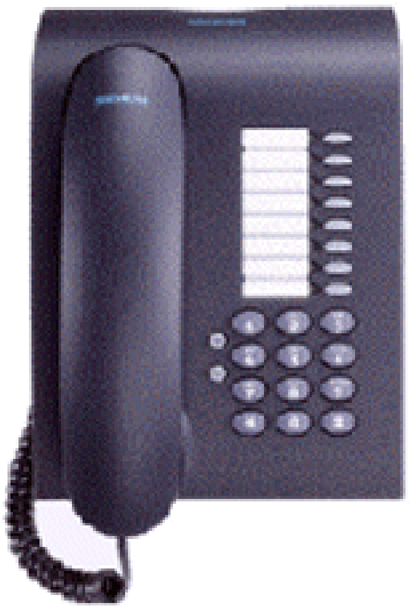
10.6.1.1 optiPoint 410 Telephones

10.6.1.1.1 optiPoint 410 entry

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 3rd party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 8 function keys (can be modified with HiPath 3000 Manager E) with LEDs
- 2 volume adjustment keys (plus/minus) and pitch
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or add-on devices), no display

Standard key assignment (default) for optiPoint 410 entry



Consultation hold
Number redial
Message
Callback
Speed dialing
Microphone on/off
Loudspeaker
Disconnect

Figure 10-20 optiPoint 410 entry - Standard Key Assignment (Default)

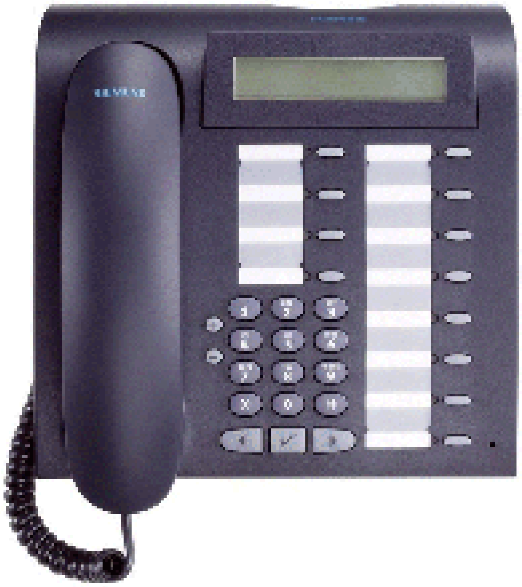
Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.1.2 optiPoint 410 economy

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 3rd party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 12 function keys (4 changeable using HiPath 3000 Manager E, 8 user-programmable) with LEDs
- Alphanumeric LCD swivel display with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or add-on devices)

Standard key assignment (default) for optiPoint 410 economy



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-21 optiPoint 410 economy - Standard Key Assignment (Default)

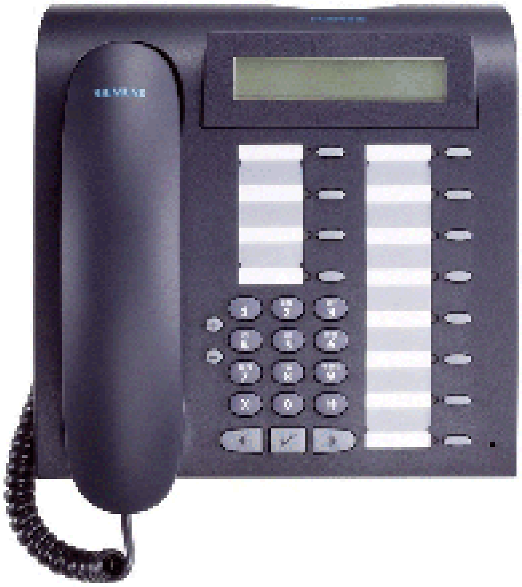
Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.1.3 optiPoint 410 standard

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 12 function keys (4 changeable using HiPath 3000 Manager E, 8 user-programmable) with LEDs
- Alphanumeric LCD swivel display with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 2 option bays
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 410 standard



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-22 optiPoint 410 standard - Standard Key Assignment (Default)

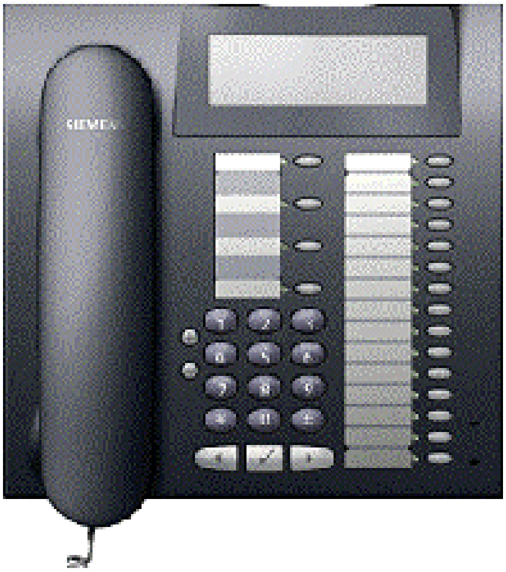
Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.1.4 optiPoint 410 advance

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 1 integrated USB 1.1 interface
- 19 function keys (4 changeable using HiPath 3000 Manager E, 15 user-programmable) with LEDs
- Graphic display (swivel) with 4 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 410 advance



Service	Programmable
Number redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-23 optiPoint 410 advance - Standard Key Assignment (Default)

Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.2 optiPoint 420 Telephones

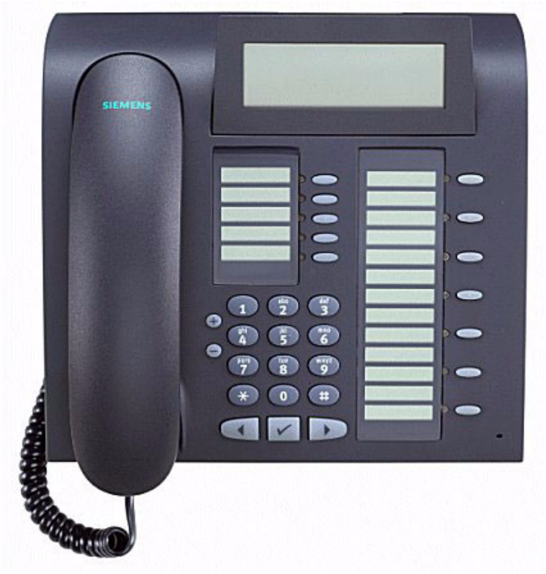
The IP telephones in the optiPoint 420 family have self-labeling keys. Self-labeling means that each key is assigned a display (1 line with 12 characters) in which the currently saved function or call number is shown.

10.6.1.2.1 optiPoint 420 economy

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 12 function keys (5 changeable using HiPath 3000 Manager E, 7 user-programmable) with LEDs and self-labeling keys
- Graphic display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or add-on devices)

Standard key assignment (default) for optiPoint 420 economy



Service	Programmable
Number redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-24 optiPoint 420 economy - Standard Key Assignment (Default)

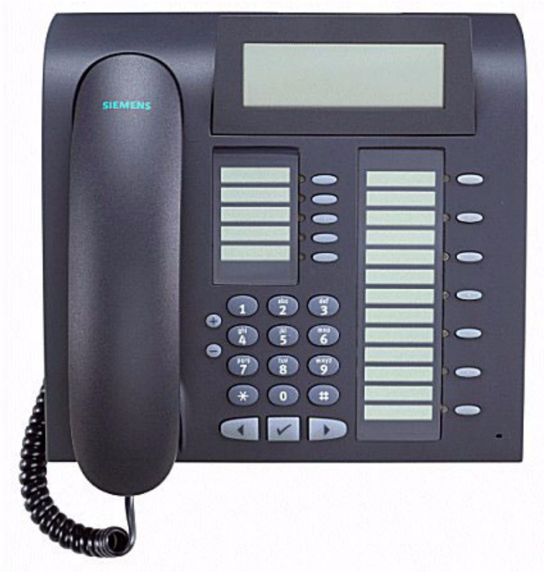
Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.2.2 optiPoint 420 economy plus

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 12 function keys (5 changeable using HiPath 3000 Manager E, 7 user-programmable) with LEDs and self-labeling keys
- Graphic display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or add-on devices)

Standard key assignment (default) for optiPoint 420 economy plus



Service	Programmable
Number redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-25 optiPoint 420 economy - Standard Key Assignment (Default)

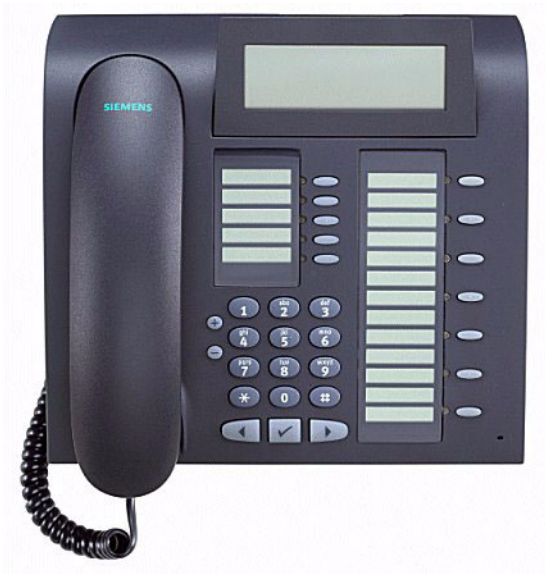
Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.2.3 optiPoint 420 standard

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 12 function keys (5 changeable using HiPath 3000 Manager E, 7 user-programmable) with LEDs and self-labeling keys
- Graphic display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 2 option bays
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 420 standard



Service	Programmable
Number redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-26 optiPoint 420 standard - Standard Key Assignment (Default)

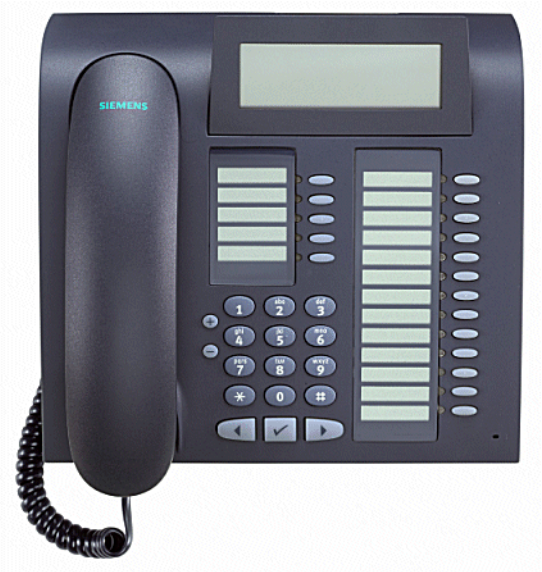
Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.2.4 optiPoint 420 advance

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 1 integrated USB 1.1 interface
- 18 function keys (5 changeable using HiPath 3000 Manager E, 13 user-programmable) with LEDs and self-labeling keys
- Graphic display (swivel) with 4 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 420 advance



Service	Programmable
Number redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Figure 10-27 optiPoint 420 advance - Standard Key Assignment (Default)

Refer to Section 10.6.1.3 for information on connection and startup.

10.6.1.3 Connection and Startup

The optiPoint 410/420 Administrator Manual contains information on how to connect and start up optiPoint 410 and optiPoint 420 telephones.

Use HiPath 3000 Manager E to configure an optiPoint IP telephone for HiPath 3000/5000.

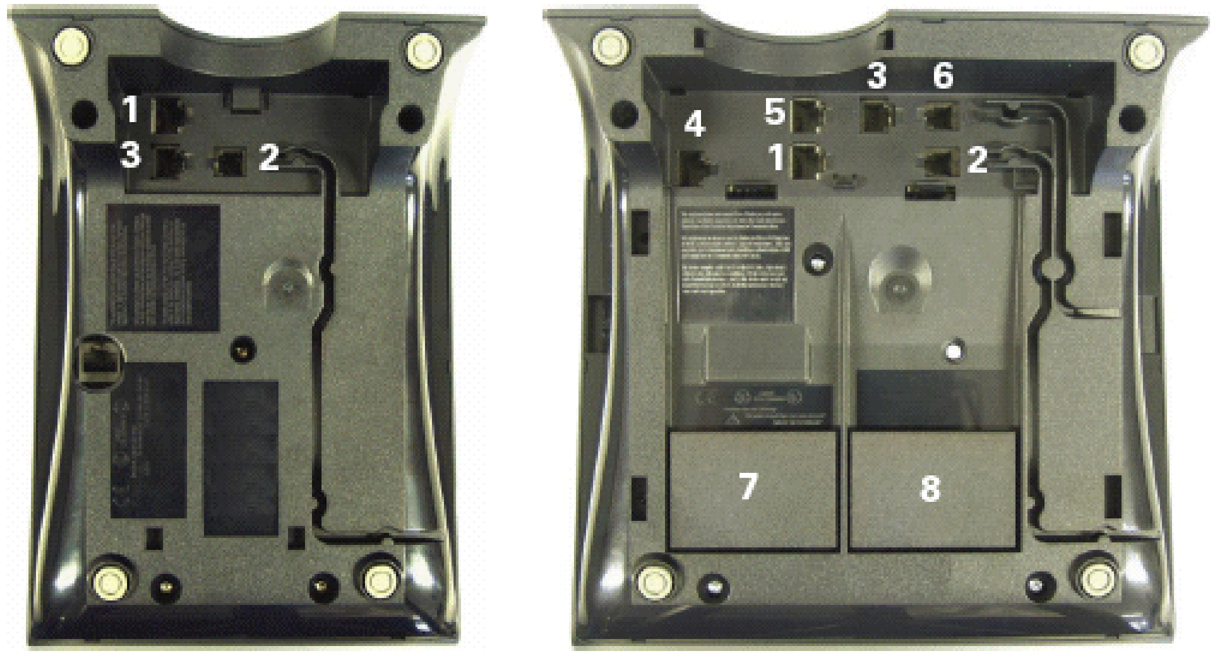
The optiPoint IP telephone software can be upgraded using:

- the Deployment Tool.
  Refer to the Deployment Tool Administrator Guide for IP Telephones for information on the tool.
- WBM access to the respective optiPoint IP telephone.
  The optiPoint 410/420 Administrator Manual contains information on this procedure.

Download

The manuals and tools referred to in this document are available for download at http://www.siemens.com/hipath (–> Downloads).

10.6.1.3.1 Connections on the Bottom of the Telephone



optiPoint 410 entry

optiPoint 410/420 standard

optiPoint 410/420 advance

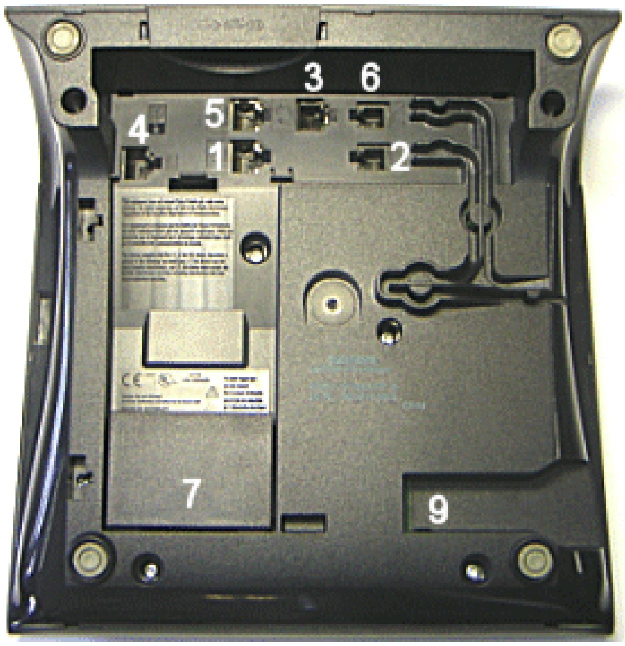


Figure 10-28 optiPoint 410/optiPoint 420 - Connection Options

Table 10-5 optiPoint 410/optiPoint 420 - Description of Connections

No.	Connection
1	Ethernet (10/100BaseT) interface (self-configuring) for the LAN
2	Handset
3	Local power supply (optional)[1]
4	Add-on device
5	Ethernet (10/100BaseT) interface (self-configuring) for the PC
6	Headset (121 TR 9-5)
7	Adapter 1
8	Adapter 2
9	USB interface

[1] No local power supply is required if power is provided via the Ethernet cable (Power over LAN).

10.6.1.4 optiPoint 410 and optiPoint 420 Add-On Devices

⚠ **Caution**
Always disconnect the line cord before connecting add-on devices to the telephone.

The user usually installs the add-on devices. The installation instructions are on the “Electronic Operating Instructions” CD.

ⓘ A maximum of two add-on devices may be installed on an optiPoint 410 or optiPoint 420 telephone (not optiPoint 410 entry, optiPoint 410 economy optiPoint 420 economy and optiPoint 420 economy plus).
optiPoint Key Module and optiPoint BLF can be used in addition to the two add-on devices described below. Table 10-6 shows the possible add-on device configurations.

10.6.1.4.1 optiPoint SLK Module

The optiPoint SLK module is an add-on device that should be mounted on the side of the telephone; it provides an additional 13 keys, LEDs, and displays for all purposes. SLK (self-labeling key) means that each key is assigned a display (1 line with 12 characters) in which the function or call number currently saved is shown.

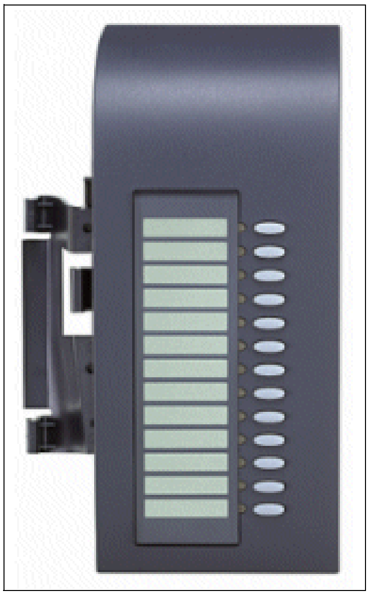


Figure 10-29 optiPoint SLK Module

Double assignment can be performed for the keys if only call numbers without LED support are saved on the first level. It is also possible to program call numbers without LED support on the second level. These can be internal station numbers, DID call numbers and call numbers from a HiPath network.

The bottom key of the first key module installed on the telephone (optiPoint SLK module or optiPoint key module) is automatically defined as “Shift key” (default). A Shift key must not already be programmed.

10.6.1.4.2 optiPoint 410 Display Module

This is an add-on device with a graphic swivel display (240 x 320 pixels) with touchscreen functionality, background illumination, and navigation keys.

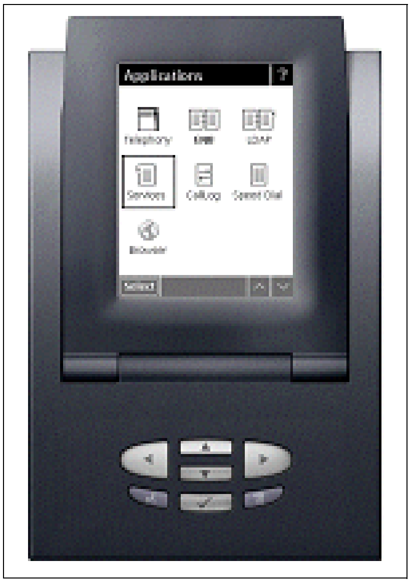


Figure 10-30 optiPoint 410 Display Module

Main features

- Graphical user interface
- Local personal telephone directory
- Access to company-wide telephone directory via LDAP
- WAP browser
- Voice-controlled dialing
- Call list containing all incoming and outgoing calls
- Speed-dialing list
- Online help

Connection

The optiPoint 410 display module must always be installed as the first add-on device, in other words, connected directly to the telephone.

The connection to the telephone is made over an interface cable with the following connectors: input MW6, output MW8. The power supply is ensured via the connected telephone.

10.6.1.4.3 Possible Configurations for the Add-On Devices

The following table shows the possible configurations for add-on devices on telephones from the optiPoint 410 and optiPoint 420 families (not optiPoint 410 entry, optiPoint 410 economy, optiPoint 420 economy and optiPoint 420 economy plus).

Table 10-6 Add-On Device Configuration at an optiPoint 410 and optiPoint 420 Telephone

optiPoint 410 telephone optiPoint 420 telephone	1st add-on device	2nd add-on device
optiPoint 410 standard optiPoint 410 advance optiPoint 420 standard optiPoint 420 advance	optiPoint key module	–
	optiPoint key module	optiPoint key module
	optiPoint key module	optiPoint BLF
	optiPoint 410 display module	–
	optiPoint 410 display module	optiPoint key module
	optiPoint 410 display module	optiPoint BLF
	optiPoint 410 display module	optiPoint SLK module
	optiPoint BLF	–
	optiPoint BLF	optiPoint BLF[1]
	optiPoint SLK module	–
	optiPoint SLK module	optiPoint SLK module

[1] Configuration with two optiPoint BLFs only with HiPath 3800, HiPath 3750, and HiPath 3700

10.6.1.5 Use of optiPoint 500 Adapters

The following optiPoint 500 adapters are available for use on telephones from the optiPoint 410 and optiPoint 420 families (not optiPoint 410 entry, optiPoint 410 economy optiPoint 420 economy and optiPoint 420 economy plus):

- optiPoint Acoustic Adapter
  Note: Floating contacts are not supported when using the adapter on optiPoint 410 and optiPoint 420.
- optiPoint Recorder Adapter

10.6.2 optiClient 130 V5.0

Definition

The optiClient 130 V5.0 is a PC-based multimedia application that offers connection services for different communication media over a LAN (network). Voice, video, or chat connections can be managed and controlled using the optiClient 130 V5.0. For voice connections, this means that the optiClient 130 V5.0 can be used on a PC like a telephone.

Modular structure

The optiClient 130 V5.0 has a modular structure for the functional elements which can be extended or replaced to change the scope of functions available.

- The basic module of the optiClient 130 V5.0 is the main bar. The main bar does not provide any communication functions itself, but instead serves as a central component that works together with the various modules to define the communication functions and display of the optiClient 130 V5.0.
- Interface modules are the modules that allow the available functions to be operated in windows and dialogs. Examples of interface modules are: telephone windows, directories, call list management, etc.
- Provider modules determine which communication systems or communication service providers the optiClient 130 V5.0 can be connected to.
- Manager modules run in the background and are not visible. They assume general communication control functions. Examples of manager modules include the Keyboard Manager and ScreenSaver Manager.

PC Prerequisites

- Operating system Windows®2000 (SP 4 or later) or Windows®XP (SP 1 or later)
- Processor: 1 GHz or higher recommended
- RAM memory: At least 512 MB

Installation and Configuration

Information on installation can be found in the readme file on the optiClient 130 V5.0 product software CD.

Use HiPath 3000 Manager E to configure a workpoint client for HiPath 3000/5000.

optiClient 130 V5.0 software can be upgraded automatically. This can be started on a user-specific basis during login, cyclically or can be skipped.

10.6.3 HiPath AP 1120

The terminal adapter HiPath AP 1120 connects up to two analog telephones and/or fax machines with a corporate network or a network provided by a carrier.

The device is capable of dynamically recognizing the most common IP telephony codecs and fax protocols, including T.38.

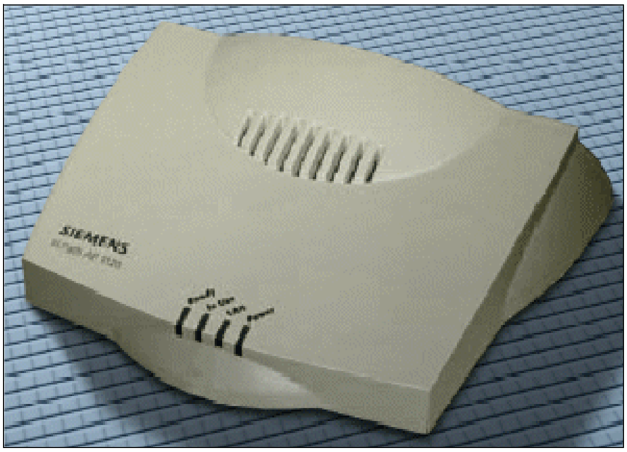


Figure 10-31 HiPath AP 1120

Connections

- Ethernet connections:
  - 1 x RJ45: 10/100 BaseT Ethernet access
  - 1 x RJ45: 10/100 BaseT Ethernet access/power supply over MDI, IEEE 802.3af (Power over LAN)
- Analog connections:
  - 2 x RJ11: analog telephone, fax
- Power supply:
  - External 24 Vdc/12 W local power supply
    No local power supply is required if power is provided via Ethernet access (Power over LAN).

Connection and configuration

Information on connecting and configuring the HiPath AP 1120 terminal adapter can be obtained from the Installation Manual (Configuration Tools and Documentation) and the Administration Manual (http://www.siemens.com/hipath (–> Downloads)).

10.6.4 HG 1500: Determining the Number of HG 1500 Boards Required

For information on the configuration of HG 1500 boards, refer to the HG 1500 Administration Manual.

10.6.4.1 Static Configuration Rules

In HiPath 3000/5000 V5.0, HG 1500 provides the resources named in Table 10-7 via the HG 1500 boards defined as media gateways (= gateway HG 1500, see Page 10-39).

Table 10-8 shows the board-specific capacity limits (maximum configuration) for the corresponding functions.

Table 10-7 Technical Data (Resources) of the HG 1500 Boards Defined as Media Gateways

Resource	**HXGM3**			**HXGS3** **HXGR3**		**STMI2**
	without PDM1	**with 1 x PDM1**	**with 2 x PDM1**	**without PDM1**	**with 1 x PDM1**	**without PDMX**[1]
Routing channels A routing channel is required, for example, for making connections between two IP networks via ISDN (ISDN routing).	16			16		16
Gateway channels (DSP channels) A gateway channel is required, for example, for connection between an IP workpoint client and a TDM workpoint client (for example, optiPoint 500).	16	24	32	8	16	32
Fax/modem channels (G.711)	16	24	32	8	16	32
Fax channels (T.38) These are special hardware resources which facilitate fax via vCAPI and fax via IP functionality with the T.38 protocol.	3			2		3
Teleworker with AES encryption and codec G.711/G.729[2] (Sampling rate) ≥ 20 msec)	10			8		10

Table 10-7 Technical Data (Resources) of the HG 1500 Boards Defined as Media Gateways

Resource	**HXGM3**			**HXGS3** **HXGR3**		**STMI2**
	without PDM1	**with 1 x PDM1**	**with 2 x PDM1**	**without PDM1**	**with 1 x PDM1**	**without PDMX**[1]
Teleworker with AES encryption and codec G.723 (sample rate ≥ 30 msec)	16			12		16
DMC channels These are the gateway channels for Direct Media Connections DMC with HiPath 4000 (DMC interworking feature is active.[3]).	12	18	24	6	12	24
MOH Channels (G.711, G.723, G.729) The number of MoH channels used depends on the configuration (HiPath 3000 Manager E).	5			5		5
LAN connections Number of LAN connections that can be used as DSL connections.	2 1			2 1		2 1

[1] PDMX is not currently released.

[2] G.729 is not currently supported by optiClient 130 V4.0.

[3] The number of gateway channels available (DSP channels) is reduced as soon as the DMC interworking feature is activated with HiPath 3000 Manager E.

Table 10-8 HG 1500 - Board-Specific Capacity Limits (Maximum Configuration)

Function	**HXGM3**			**HXGS3** **HXGR3**		**STMI2**
Function	**without PDM1**	**with 1 x PDM1**	**with 2 x PDM1**	**without PDM1**	**with 1 x PDM1**	**without PDMX**[1]
PPP Routing Partner	70			70		70
vCAPI clients IP workpoint clients that support vCAPI.	100			100		100
MOH data streams	10			10		10

[1] PDMX is not currently released.

10.6.4.2 Dynamic Configuration Rules

10.6.4.2.1 Gateway channels (DSP channels)

Gateway connections are required for connections to TDM workpoint clients and lines. A gateway channel is required on the HiPath HG 1500 board for each gateway connection. TDM workpoint clients and trunks include, for example

- $U_{P0/E}$ stations (optiset E, optiPoint 500)
- CMI stations
- analog stations
- ISDN stations
- trunk and tie lines (MSI, S_0, S_{2M})

Examples: a consultation call to an optiPoint 500 telephone is set up during an existing connection between two IP workpoint clients. A HG 1500 board gateway channel is necessary for the consultation call.
An IP workpoint client seizes a trunk. A HG 1500 board is required for this trunk.

In the case of conferences, the number of gateway channels seized corresponds to the number of stations and IP workpoint clients involved.

Channels required for gateway connections

The following table shows the number of gateway channels (HG 1500 boards) necessary based on the existing IP workpoint clients.

The calculation of the values is based on the following assumptions:

- A station spends 10 % of its working time in call status.
- The average time per call is three minutes.
- The availability loss is limited to 1.2 %.

Provisions should be made for more gateway channels (HG 1500 boards) in high-traffic volume environments (for example, call centers).

Table 10-9 Number of Required Gateway Channels (HG 1500 Boards)

IP workpoint clients in the system	Required number of gateway channels
0 – 3	2
4 – 12	4
13 – 16	6
17 – 38	8

Table 10-9 Number of Required Gateway Channels (HG 1500 Boards)

IP workpoint clients in the system	Required number of gateway channels
39 – 54	10
55 – 70	12
71 – 86	14
87 – 96	15
97 – 101	16
102 – 136	20
137 – 172	24
173 – 210	28
211 – 247	32
248 – 324	40
325 – 402	48
403 – 481	56
482 – 562	64
563 – 726	80
727 – 890	96
891 – 1000	112

In a straightforward IP network, the number of gateway channels must be greater than or equal to the number of TDM lines.

The required number of HG 1500 boards for VoIP is determined by the sum of the gateway channels, MOH channels and conference channels

10.6.4.2.2 MOH Channels (G.711, G.723, G.729)

A DSP channel is used to provide MOH for IP workpoint clients. Depending on the configuration (HiPath 3000 Manager E), up to five DSP channels can be used for MOH.

A maximum of 10 MOH data streams per HG 1500 board are possible. This means that up to 10 IP workpoint clients can simultaneously hear MOH.

A DSP channel is required for each codec (G.711, G.723, G.729), irrespective of the number of MOH data streams. If more than 10 MOH data streams are required, additional HG 1500 boards must be used.

A B channel license is not required for MOH.

10.6.4.2.3 IP Networking Channels (PBX Networking Channels)

IP networking channels are used for connections between communication systems. In this case, a distinction must be made between connections that use a gateway channel and direct payload connections. Depending on the connection, the following resources are required for successful connection setup.

Connection type	Line	Gateway channel
Direct payload connection	Required	Not required
Gateway connection	Required	Required

A connection request is rejected if a required resource is unavailable.

HiPath 3000 Manager E is used to define how many of the maximum number of lines are to be configured as IP networking channels (IP network trunks). The maximum number of IP network trunks can be found in Table 2-7.

10.6.4.2.4 DMC (Direct Media Connection) Channels

When the DMC interworking feature is active in an IP network between HiPath 3000 and HiPath 4000, gateway connections are set up over DMC channels. From the user's perspective, a DMC channel is a gateway channel that provides a gateway connection between HiPath 3000 and HiPath 4000. The fact that a DMC channel must serve both a master and slave connection results in a DSP channel reduction.

Note: The number of gateway channels available (DSP channels) is reduced as soon as the DMC interworking feature is activated with HiPath 3000 Manager E. In this case, a Digital Signal Processor (DSP) can only provide up to 80% of all possible channels (for example: 6 instead of 8 DSP channels, 12 instead of 16 DSP channels, etc.).

10.6.4.2.5 ISDN Routing/PPP Channels

HG 1500 boards can also be used as ISDN routers. The ISDN router can connect two physically separate IP networks together via an ISDN line. Channel bundling can be used to adjust the required bandwidth.

The system reserves the B channels required for ISDN routing and thus restricts the available gateway channels.

Table 10-10 HG 1500 - Board-Specific Sum of PPP Channels and Gateway Channels (Maximum Numbers)

	HXGM3			**HXGS3 HXGR3**		**STMI2**
	without PDM1	**with 1 x PDM1**	**with 2 x PDM1**	**without PDM1**	**with 1 x PDM1**	**without PDMX[1]**
Sum of PPP channels (for ISDN routing) and gateway channels	16	24	32	8	16	32

[1] PDMX is not currently released.

If a large number of IP workpoint clients is required, the HG 1500 board may not also be used as an ISDN router. In this case, ISDN routing functionality must be assigned to an individual HG 1500 board.

10.6.4.2.6 Fax / Modem Channels

Fax and modem transmissions can be sent both over transparent G.711 gateway channels and T.38 channels (fax only).

Although T.38 offers the more reliable method of fax transmission, it can only be used to a maximum of 14 Kbps. The number of T.38 channels available is limited by the higher processor speed required for T.38. Alternatively, G.711 gateway channels can be used for fax transmission.

Note: The number of G.711 gateway channels available is reduced as soon as the DMC interworking feature is activated with HiPath 3000 Manager E.

10.6.4.3 Determining the Number of HG 1500 Boards Required

The intensity with which gateway connections and ISDN routing are used determines the number of HG 1500 boards necessary.

HG 1500 resources sufficient?

Using the following calculations you can determine if the available HG 1500 boards are sufficient or if additional resources are required in the form of other HG 1500 boards.

Following tests, the performance level required by each HG 1500 function was determined, and assigned a value in points. This is the performance level that must be supported by the board. This calculation is based on the assumption that the following performance point totals are available for each HG 1500 board:

HG 1500 board	Total performance points per board
HXGM3	980
HXGS3, HXGR3	780
STMI2	980
Note: Any available extension modules (PDM1, PDMX, etc.) are included in the additional performance requirement in Table 10-11.	

Table 10-11 Required Performance Level for Voice over IP

Function		Resource requirement (credit point)
Available extension modules	Per PDM1	10
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	IP workpoint clients: system client, HFA client, H.323 client (8 calls per hour)	0.51
	IP networking channel (25 calls per hour)	3.2
Signaling with activated H.235 security (independent of the WBM setting "Enhanced B Channels")	IP workpoint clients: system client, HFA client, H.323 client (8 calls per hour)	0.82
	IP networking channel (25 calls per hour)	3.8

Table 10-11 Required Performance Level for Voice over IP

Function		**Resource requirement (credit point)**
Payload (additional feature: "Enhanced B Channels" Enabled over WBM.)	Voice gateway channel over LAN interface 1:	
	G.711 (received: 20 msec/sent: 20 msec)	11
	G.729 (received: 20 msec/sent: 20 msec)	11
	G.723 (received: 30 msec/sent: 30 msec)	7.5
Payload (additional feature: "Enhanced B Channels" disabled over WBM.)	Voice gateway channel over LAN interface 1 without encryption:	
	G.711 (received: 20 msec/sent: 20 msec)	39
	G.729 (received: 20 msec/sent: 20 msec)	39
	G.723 (received: 30 msec/sent: 30 msec)	26
	Voice gateway channel over LAN interface 2 without encryption:	
	G.711 (received: 20 msec/sent: 20 msec)	73
	G.729 (received: 20 msec/sent: 20 msec)	73
	G.723 (received: 30 msec/sent: 30 msec)	49
	Voice gateway channel over LAN interface 2 with encryption:	
	G.711 (received: 20 msec/sent: 20 msec) with AES encryption	89
	G.711 (received: 20 msec/sent: 20 msec) with 3DES encryption	104
	G.729 (received: 20 msec/sent: 20 msec) with AES encryption	89
	G.729 (received: 20 msec/sent: 20 msec) with 3DES encryption	104
	G.723 (received: 30 msec/sent: 30 msec) with AES encryption	60
	G.723 (received: 30 msec/sent: 30 msec) with 3DES encryption	70
	Voice gateway channel routing over PPP:	
	G.729 with packetizing of 3 (60 msec)	54
	G.729 with packetizing of 1 (20 msec)	150
	G.723 with packetizing of 3 (60 msec)	57
	G.723 with packetizing of 1 (30 msec)	100

Table 10-12 Performance Requirements for Routing and vCAPI

Function		**Resource requirement (credit point)**
Data transfer (additional feature: "Enhanced B Channels" disabled over WBM)	Data routing:	
	Data routing over PPP	55 per B channel
	IP routing between LAN interface 1 and LAN interface 2:	
	Without encryption with 1400-byte packet length	96 for 100 packets/ sec.
	With AES encryption and 1400-byte packet length	198 for 100 packets/ sec.
	With 3DES encryption and 1400-byte packet length	329 for 100 packets/ sec.
	Without encryption with 500-byte packet length	79 for 100 packets/ sec.
	With AES encryption and 500-byte packet length	119 for 100 packets/ sec.
	With 3DES encryption and 500-byte packet length	166 for 100 packets/ sec.
	Without encryption with 100-byte packet length	72 for 100 packets/ sec.
	With AES encryption and 100-byte packet length	84 for 100 packets/ sec.
	With 3DES encryption and 100-byte packet length	93 for 100 packets/ sec.
	VCAPI services:	
	Fax channel	11
	Data channel	34

10.6.4.4 Sample Calculation

10.6.4.4.1 Calculation Example 1: 32 IP Networking Connections to HiPath 3750, HiPath 3700

HiPath 3750 or HiPath 3700 are connected to another system via an IP networking path with 32 B channels. Codec G.711 is used with a sample rate of 20 msec without encryption for the IP networking path. The customer only has TDM workpoint clients.

An HXGM3 board with two PDM1 modules is necessary for this configuration:
2 DSPs per HXGM3 and 2 x 1 DSP per PDM1 = 4 DSPs, together supporting up to 32 channels.
Correspondingly, the total performance available is 980 points.

Performance requirement

32 gateway channels via LAN interface 1 should be included in the calculation. The setting “Enhanced B Channels” must be activated for this via the WBM. The Virtual Private Network VPN and Firewall functions are automatically deactivated when this setting is activated.
The signaling load has to be taken into account when calculating performance.

Function		**Resource requirement (credit point)**
Available extension modules	2 x PDM1	2 x 10 = 20.0
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	32 x IP networking channel (25 calls per hour)	32 x 3.2 = 102.4
Payload (additional feature: "Enhanced B Channels" enabled over WBM.)	Voice gateway channel over LAN interface 1:	
	32 x G.711 (received: 20 msec/sent: 20 msec)	32 x 11.0 = 352.0
Total =		**474.4**

The specified performance requirement of 474.4 points is below the 980 total performance points that the HXGM3 board can provide. The configuration is feasible.

Note: The configuration is not feasible for HXGS3 and HXGR3 because the static configuration rules only permit up to 16 channels per board.

10.6.4.4.2 Calculation Example 2: 96 IP workpoint clients and 16 IP networking connections to HiPath 3750, HiPath 3700

HiPath 3750 or HiPath 3700 with 96 IP workpoint clients (system clients) and additional TDM workpoint clients are connected to another system via an IP networking path with 16 B channels. As described in Table 10-9, 15 gateway channels are needed for 96 IP workpoint clients (at 0.1 erlangs/workpoint client). Codec G.711 with a sample rate of 20 ms without encoding is required for the IP networking paths and the IP network clients.

An HXGM3 board with two PDM1 modules is necessary for this configuration:
2 DSPs per HXGM3 and 2 x 1 DSP per PDM1 = 4 DSPs, together supporting up to 32 channels.
Correspondingly, the total performance available is 980 points.

Performance requirement

Thirty-one gateway channels via LAN interface 1 should be included in the calculation. The setting “Enhanced B Channels” must be activated for this via the WBM. The Virtual Private Network VPN and Firewall functions are automatically deactivated when this setting is activated. The signaling load has to be taken into account when calculating performance.

Function		Resource requirement (credit point)
Available extension modules	2 x PDM1	2 x 10 = 20.0
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	96 x IP workpoint client: System client, HFA client, H.323 client (eight calls an hour)	96 x 0.51 = 48.96
	16 x IP networking channel (25 calls per hour)	16 x 3.2 = 51.2
Payload (additional feature: Enhanced B Channels disabled over WBM.)	Voice gateway channel over LAN interface 1:	
	31 x G.711 (received: 20 msec/sent: 20 msec)	31 x 11.0 = 341.0
	Total =	**461.16**

The specified performance requirement of 461.16 points is below the 980 total performance points that the HXGM3 board can provide. The configuration is feasible.

10.6.4.4.3 Calculation Example 3: 200 IP Workpoint Clients and Internet Access to HiPath 3750, HiPath 3700

200 IP workpoint clients should be connected to HiPath 3750 or HiPath 3700. As described in Table 10-9, 28 gateway channels are required for 200 IP workpoint clients (0.1 erlangs/workpoint client). In addition, a DSL connection with 192 Kbps upstream (from HG 1500 –> Internet) and 2048 Kbps downstream (Internet –> HG 1500) should be configured. The firewall should be activated here but not encryption.

Two HXGM3 boards are required for this configuration:
2 DSPs per HXGM3 = 2 x 2 DSPs = 4 DSPs, which together support up to 32 channels.

Performance requirement for the Signaling Gateway (= Gatekeeper HG 1500)

G.711 is required for IP workpoint client connections. The firewall must be activated for the DSL connection. For this reason the calculation method with the WBM setting "Enhanced B Channels" deactivated should be used for the 14 gateway channels on each HXGM3.
The signaling load has to be taken into account when calculating performance.

Function		Resource requirement (credit point)
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	200 x IP workpoint client: System client, HFA client, H.323 client (eight calls an hour)	200 x 0.51 = 102.0
Payload (additional feature: Enhanced B Channels disabled over WBM.)	Voice gateway channel over LAN interface 1 without encryption:	
	14 x G.711 (received: 20 msec/sent: 20 msec)	14 x 39.0 = 546.0
	Total =	**648.0**

The specified performance requirement of 648.0 points is below the 980 total performance points that the HXGM3 board can provide. The configuration is feasible.

Performance requirement for the Media Gateway (= Gateway HG 1500)

Calculation of the dynamic performance requirement for the DSL connection on the basis of the highest throughput rates (upstream = 192 Kbps = (192 x 1000) / 8 bps = 24000 bps, Downstream = 2048 Kbps = (2048 x 1000) / 8 bps = 256000 bps). The following formulae apply for 1400 byte packet length:

Upstream:

$$\frac{24000 \text{ bps}}{1400 \text{ bytes/packet}} = 17 \text{ packets/sec}$$

Downstream:

$$\frac{256000 \text{ bps}}{1400 \text{ bytes/packet}} = 183 \text{ packets/sec}$$

Function		**Resource requirement (credit point)**
Data transfer (additional feature: Enhanced B Channels disabled over WBM.)	DSL connection (without encryption with 1400 bytes packet length, performance requirement (score) = 96 for 100 packets/sec):	
	17 packets/sec upstream (192 kbps)	17 x (96 / 100) = 16.32
	183 packets/sec downstream (2048 kbps)	183 x (96 / 100) = 175.68
Payload (additional feature: Enhanced B Channels disabled over WBM.)	Voice gateway channel over LAN interface 1 without encryption:	
	14 x G.711 (received: 20 msec/sent: 20 msec)	14 x 39.0 = 546.0
	Total =	**738.0**

The specified performance requirement of 738.0 points is below the 980 total performance points that the HXGM3 board can provide. The configuration is feasible.

10.6.4.4.4 Calculation Example 4: IP Networking Connections and Voice over PPP (ISDN Routing) to HiPath 3750, HiPath 3700

HiPath 3750 or HiPath 3700 (central systems) are connected to a second system (branch office 1) via ISDN routing with two PPP channels (S_0) and to a third system (branch office 2) via a direct LAN connection (IP networking channels).

Voice over PPP with Codec G.729 and a sample rate of 60 ms without encoding is used for the ISDN routing connection to branch office 1. This means that six voice channels are supported by the two PPP channels (S_0). Eight IP networking channels are sufficient for the IP networking connection to branch office 2. Codec G.729 with a sample rate of 20 msec without encryption is used for this connection.

(6 + 8 =) 14 channels must be configured in the central offices, six channels in branch office 1 and eight channels in branch office 2.

An HXGM3 board without PDM module is sufficient for this configuration:
2 DSPs per HXGM3 = 2 DSPs, together supporting up to 16 channels.
Correspondingly, the total performance available is 980 points.

Performance requirement

The payload and the signaling load have to be taken into account when calculating performance.

Function		Resource requirement (credit point)
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	14 x IP networking channel (25 calls per hour)	14 x 3.2 = 44.8
Payload (additional feature: "Enhanced B Channels" disabled over WBM.)	Voice gateway channel over LAN interface 1 without encryption:	
	8 x G.711 (received: 20 msec/sent: 20 msec)	8 x 39.0 = 312.0
	Voice gateway channel routing over PPP:	
	6 x G.729 with packetizing of 3 (60 msec)	6 x 54.0 = 324.0
	Total =	**680.8**

The specified performance requirement of 680.8 points is below the 980 total performance points that the HXGM3 board can provide. The configuration is feasible.

10.6.4.4.5 Calculation Example 5: Virtual Private Network VPN

Two branch systems (HiPath 3550 or HiPath 3500) should be connected to a central system (HiPath 3750 or HiPath 3700) via VPN. The central system only has TDM workpoint clients. Eight IP networking channels are available via LAN interface 2 for the connection to the branches. Both branches have 30 IP workpoint clients and eight gateway channels for the connection to the ISDN trunk. Additionally, four IP networking channels are available for connection to the central office.

G.711 with a sample rate of 20 msec is used for the VPN networking. The connection between the central and branch offices should be set up over the Internet using an AES-encrypted VPN tunnel.

The following boards are necessary for this configuration:

- Central office: An HXGM3 (2 DSPs per HXGM3 together supporting up to 16 channels)
- Branch office: One HXGR3 each (1 DSP per HXGR3, supporting up to 8 channels)

Correspondingly, the total performance available in the central office is 980 points, and 780 points in each of the branches.

Central office requirements

Eight gateway channels via LAN interface 2 with AES encryption should be included in the calculation. Since VPN functionality is required, the WBM setting "Enhanced B Channels" is deactivated.

Function		Resource requirement (credit point)
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	8 x IP networking channel (25 calls per hour)	8 x 3.2 = 25.6
Payload (additional feature: "Enhanced B Channels" disabled over WBM.)	Voice gateway channel over LAN interface 2 with encryption:	
	8 x G.711 (received: 20 msec/sent: 20 msec) with AES encryption	8 x 89.0 = 712.0
	Total =	**737.6**

The specified performance requirement of 737.6 points is below the 980 total performance points that the HXGM3 board can provide. This configuration is feasible for the central office.

Branch performance requirements

Four gateway channels via LAN interface 2 with AES encryption should be included in the calculation. As described in Table 10-9, eight gateway channels are required for 30 IP workpoint clients (at 0.1 erlangs/workpoint client). Since VPN functionality is required, the WBM setting "Enhanced B Channels" is deactivated.

Function		**Resource requirement (credit point)**
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	30 x IP workpoint client: System Client, HFA client, H.323 client (eight calls an hour)	30 x 0,51 = 15.3
	4 x IP networking channel (25 calls per hour)	4 x 3.2 = 12.8
Payload (additional feature: Enhanced B Channels Disabled over WBM.)	Voice gateway channel over LAN interface 2 with encryption:	
	4 x G.711 (received: 20 msec/sent: 20 msec) with AES encryption	4 x 89.0 = 356.0
	Voice gateway channel over LAN interface 1 without encryption:	
	8 x G.711 (received: 20 msec/sent: 20 msec)	8 x 39.0 = 312.0
	Total =	**696.1**

The determined resource requirement of 696.1 points is less than the overall performance of 780 points which the HXGR3 board can provide. The branch configuration is feasible.

10.6.4.4.6 Calculation Example 6: Connecting teleworkers via VPN

Eight teleworkers should be connected to HiPath 3750 or HiPath 3700. G.723 with a sample rate of 30 msec is required. In addition duplex data transmission with 512 Kbps is also to be enabled via the 2 Mbps SDSL port connected to LAN interface 2. The average packet size is 500 bytes. VPN should be used with AES encryption.

HXGM3 board is required for this configuration:
2 DSPs per HXGM3 = 2 DSPs, which together support up to 16 channels.
Correspondingly, the total performance available is 980 points.

Performance requirement

Calculation of the dynamic performance requirement for the SDSL connection based on the required data exchange rate (512 kbps = (512 X 1000)/8 bps = 64000 bps per route). The following formula applies for 500 byte packet length:

$$\frac{64000\ \text{bps}}{500\ \text{bytes/packet}} = \ 128\ \text{packets/route} = 256\ \text{packets/s for both routes}$$

Since VPN functionality is required, the WBM setting "Enhanced B Channels" is deactivated.

Function		**Resource requirement (credit point)**
Data transfer (additional feature: Enhanced B Channels Disabled over WBM.)	SDSL connection (with AES encryption and 500 bytes packet length, performance requirement (score) = 119 for 100 packets/sec):	
	256 packets/sec	256 x (119 / 100) = 304.64
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	8 x IP workpoint client: System Client, HFA client, H.323 client (eight calls an hour)	8 x 0.51 = 4.08
Payload (additional feature: Enhanced B Channels Disabled over WBM.)	Voice gateway channel over LAN interface 2 with encryption:	
	8 x G.723 (received: 30 msec/sent: 30 msec) with AES encryption	8 x 60.0 = 480.0
	Total =	**788.72**

The specified performance requirement of 788.72 points is below the 980 total performance points that the HXGM3 board can provide. The configuration is feasible.

Bandwidth requirement

For information on bandwidths, refer to the System Description HiPath 3000/5000 V5.0

Bandwidth calculation	Bandwidth	Totals
8 channels with AES encryption, G.723 with a sample rate of 30 msec	8 x 44.3 Kbps	354.4 Kbps
Data transfer		512.0 Kbps
	Total =	**866.4 Kbps**

A 1 Mbps connection would be sufficient for this configuration.

10.6.4.4.7 Calculation Example 7: Virtual Private Network VPN with Customer Specifications: 1000 Kbps Bandwidth for Data Transfer, Remaining Bandwidth for Voice Transmission

The 2 Mbps SDSL connection of an HXGM3 board (HiPath 3750 or HiPath 3700) is to enable duplex data transmission at 1000 Kbps. The average packet size is 500 bytes. In addition, the SDSL connection for IP Networking connections with G.729 and a sample rate of 20ms should be used.

Performance Requirements for SDSL Connection

Calculation of the dynamic performance requirement for the SDSL connection based on the required data exchange rate (1000kbps = (1000 x 1000)/8 bps = 125000 bps per route). The following formula applies for 500 byte packet length:

$$\frac{125000 \text{ bps}}{500 \text{ bytes/packet}} = 250 \text{ packets/route} = 500 \text{ packets/s for both routes}$$

Function		Resource requirement (credit point)
Data transfer (additional feature: Enhanced B Channels Disabled over WBM.)	SDSL connection (with AES encryption and 500 bytes packet length, resource requirement (score) = 119 for 100 packets/sec):	
	500 packets/sec	500 x (119 / 100) = 595.0
	Total =	**595.0**

Number of possible simultaneous IP networking connections

A performance requirement of 595 points is specified for the SDSL connection. Since the HXGM3 board can provide total performance of 980 points, 385 performance points are available for IP networking connections.

Function		Resource requirement (credit point)
Signaling without H.235 security (independent of the WBM setting "Enhanced B Channels")	IP Networking Channel (25 calls per hour)	3.2

Function		Resource requirement (credit point)
Payload (additional feature: Enhanced B Channels Disabled over WBM.)	Voice gateway channel over LAN interface 2 with encryption:	
	G.729 (received: 20 msec/sent: 20 msec) with AES encryption	89.0
	Total =	**92.2**

Each IP networking connection requires 92.2 performance points.

Up to four simultaneous connections are possible with the 385 performance points available for networking connections (385 / 92.2 = 4.18).

Bandwidth requirement

For information on bandwidths, refer to the System Description HiPath 3000/5000 V5.0.

Bandwidth calculation	Bandwidth	Totals
4 channels with AES encryption, G.729 with a sample rate of 20 msec	4 x 60 Kbps	240 Kbps
Data transfer		1024 Kbps
	Total =	**1264 Kbps**

A 2 Mbps connection would be sufficient for this configuration.

10.6.4.5 Notes on the Maintenance of Gateway Channels HiPath 3000/5000 V5.0 or later

> ⓘ In V5.0 and later, when a number of trunks is configured for IP networking with HiPath 3000 Manager E(IP networking channels), this no longer results in the reservation of B channels. This means that the available B channels can be used as gateway channels.
> These resources are administered centrally via a single HG 1500 board, i.e. the ’Signaling Gateway’ (= Gatekeeper HG 1500), regardless of how many HG 1500 boards are available in a system.

Sample Connection Scenarios:

- Internal node connections between IP workpoint clients are direct payload connections. No gateway channel is necessary. The number of possible concurrent connections depends on the number of licensed IP workpoint clients.
- Node-to-node connections (IP networking) between IP workpoint clients are direct payload connections. No gateway channel is necessary. The number of possible concurrent connections depends on the number of IP networking channels available.
- Node-to-node connections (IP networking) between TDM workpoint clients require one IP networking channel per connection and one gateway channel per node.

Example: B Channel Distribution in IP Networking

	Number of licensed B channels =	8	This means that 8 channels to the switching network are permitted.
–	Number of routing channels =	2	Configuration with WBM
=	Number of remaining B channels for gateway channels =	6	

Note on Music On Hold (MOH): A license is not required for the MOH channel. If 8 B channels are licensed, this means that the MOH channel can be used as a 9th channel. The number of MOH Channels can be configured.

If 16 B channels are licensed and used exclusively for IP workpoint clients, the 16th B channel must be used as the MOH channel.

10.7 optiPoint Accessories

The following data is valid for the telephone families optiset E, optiPoint 410, optiPoint 420, optiPoint 500 and for the telephone optiPoint 600 office. Restrictions are indicated in the relevant places.

10.7.1 External AC Adapters

You may need an external AC adapter if you are using large configurations or if you need to extend the range.

10.7.1.1 Local Power Supply for optiset E, optiPoint 500 and optiPoint 600 office

You can connect a local power supply to the line cords of a host or client telephone using two MW6 jacks and the connection cable supplied (see Figure 10-32).

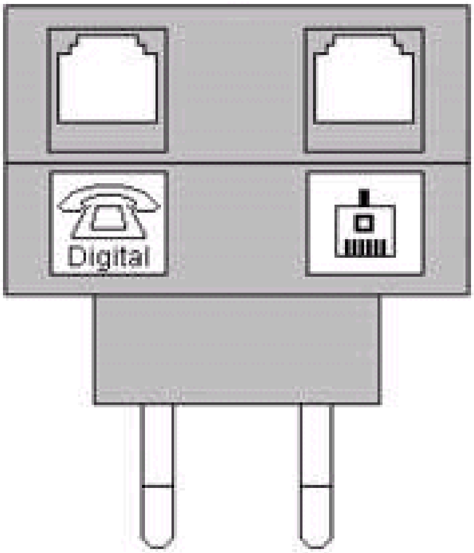
Variants

- Local power supply, Euro: AUL:06D1284 (C39280-Z4-C71 = number entered on unit)
- Local power supply, UK: AUL:06D1287 (C39280-Z4-C72 = number entered on unit)
- Local power supply, 110 V USA: AUL:51A4827 (C39280-Z4-C73 = number entered on unit)

Data for local power supply AUL:06D1284 (Euro)

- Line voltage: 220 (230) Vac
- AC line frequency: 47 ... 53 Hz
- Output voltage: Max. 50 Vdc, min. 30 Vdc
- Output current: Max. 250 mA

Table 10-13 Pin Assignments of the Local Power Supply AUL:06D1284 (Euro)

Pin	Assignment	
1	Not used	
2	–	
3	a-Wire (Tip)	
4	b-Wire (Ring)	
5	+	
6	Not used	

Example: External AC Adapter Connection

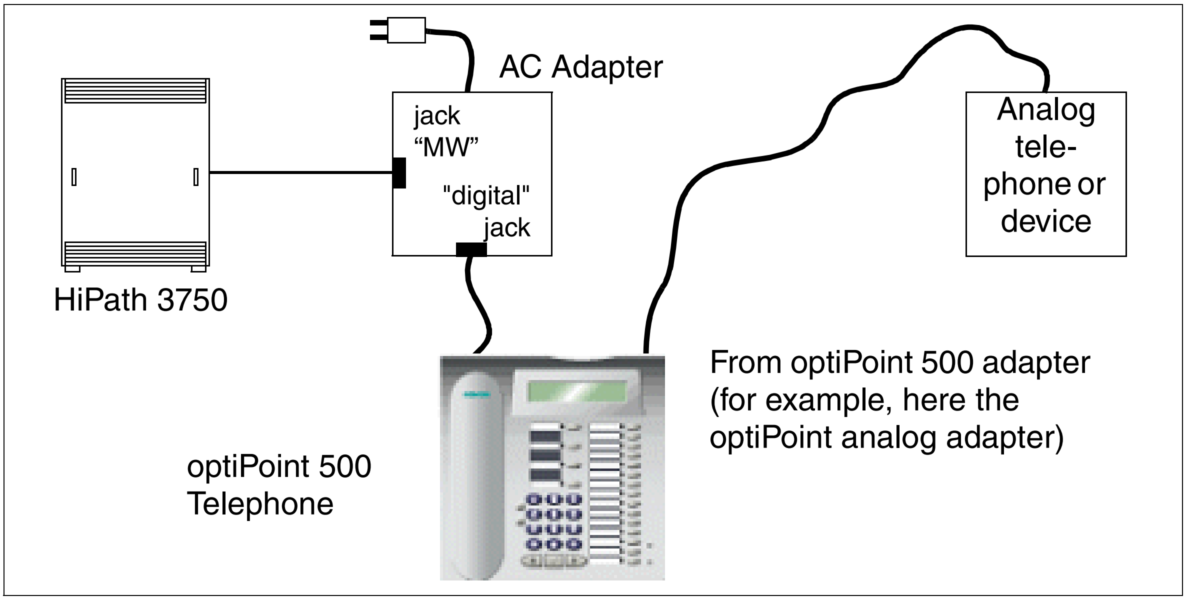
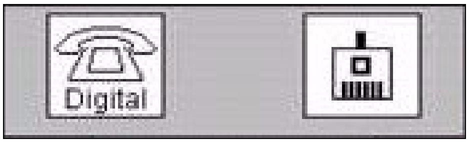

AC Adapter
jack
“MW”
"digital"
jack
Analog
tele-
phone or
device
HiPath 3750
From optiPoint 500 adapter
(for example, here the
optiPoint analog adapter)
optiPoint 500
Telephone

Figure 10-32 Example of an External AC Adapter Connection

10.7.1.2 AC Adapter for optiPoint 410 and optiPoint 420

The AC adapter features two MW6 connectors. Power is supplied to a telephone via the left board marked "Digital".



Variants

- AC adapter, Euro: C39280-Z4-C510
- AC adapter, UK: C39280-Z4-C512
- AC adapter, 110 V USA: C39280-Z4-C511

Technical Specifications

Technical Specifications	AC adapter, Euro: C39280-Z4-C510	AC adapter, UK: C39280-Z4-C512	AC adapter, 110 V USA: C39280-Z4-C511
Line voltage	230 VAC	230 VAC	120 VAC
Line frequency	50 Hz	50 Hz	60 Hz
Output voltage	max. 43 VDC, min. 30 VDC	max. 43 VDC, min. 30 VDC	max. 43 VDC, min. 30 VDC
Output current	480 mA	480 mA	480 mA

10.7.2 Headsets

A headset replaces the telephone handset, which means that the user’s hands are free when telephoning. The use of a cordless headset (121 TR 9-5) is also possible.

Note: A headset key can be configured for optiPoint or optiset E telephones. This allows the user to take calls and to toggle between the handset and the headset.

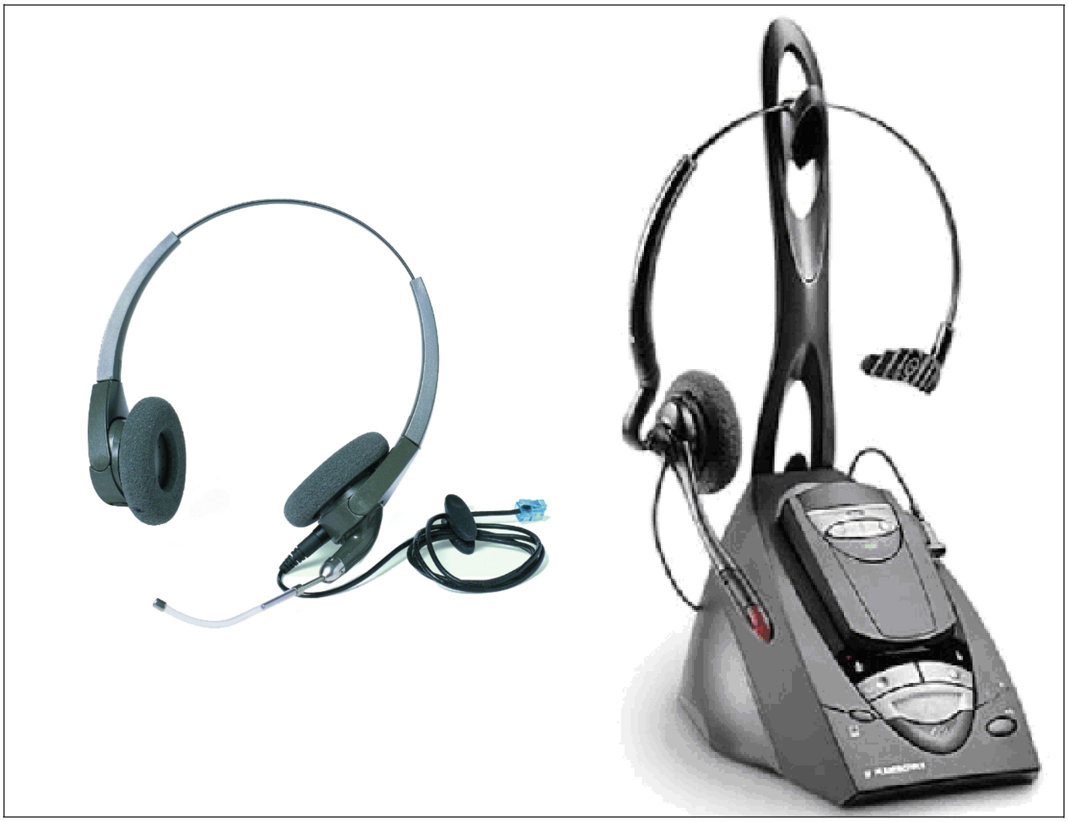


Figure 10-33 Example of a Corded and a Cordless Headset

Connection options

optiPoint and optiset E telephones not included in the table below do not support headset connection.

Table 10-14 Connection Options for Corded and Cordless Headsets

Telephone	**Connection Options for Corded and Cordless Headsets**			
	Direct	**Using an optiPoint acoustic adapter**[1]	**Using an optiset E headset adapter headset plus adapter**	**Using an optiset E control adapter**
optiPoint 500 basic		X		
optiPoint 500 standard, optiPoint 500 standard SL (For U.S. Only)		X		
optiPoint 500 advance	X	X		
optiPoint 600 office	X	X		
optiPoint 410 standard	X	X		
optiPoint 410 advance	X	X		
optiPoint 420 economy plus	X			
optiPoint 420 standard	X	X		
optiPoint 420 advance	X	X		
optiset E basic			X	
optiset E advance plus/comfort			X	X
optiset E advance conference/conference			X	X
optiset E memory			X	X

[1] Accepting and ending calls using the headset keys is only supported if the connection is established using an optiPoint acoustic adapter.

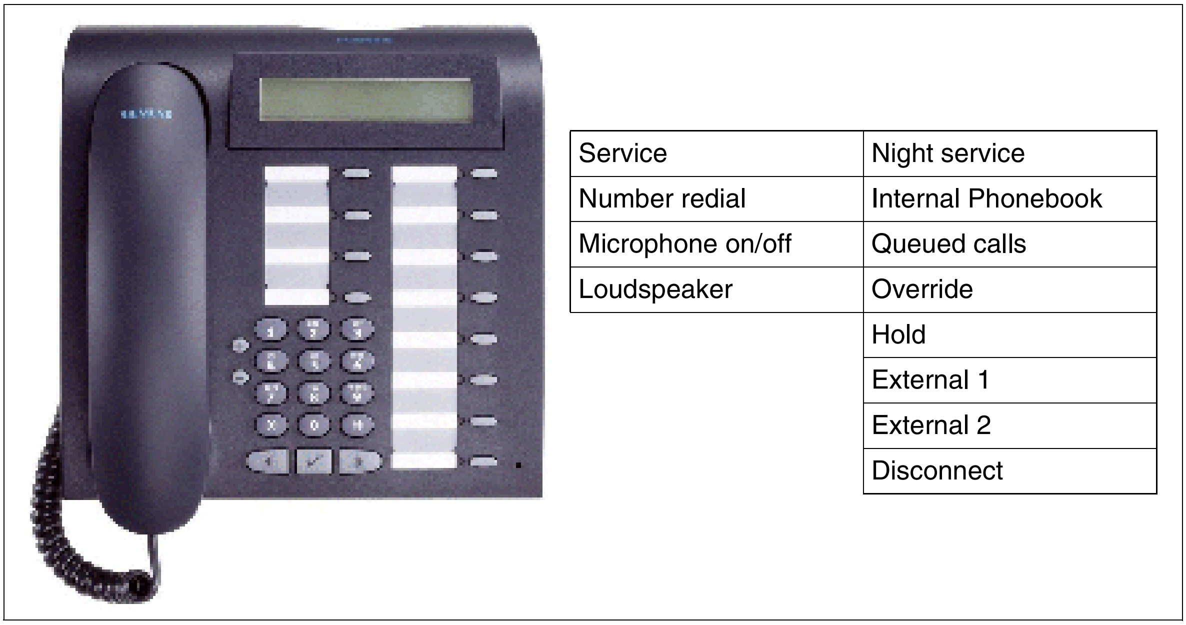
Information on connecting the headset is provided in the relevant installation instructions.

10.8 Attendant console versions

10.8.1 optiPoint Attendant

A specially equipped optiPoint 500 basic, optiPoint 500 standard, optiPoint 500 advance or optiPoint 600 office can perform switching services for HiPath 3000/5000. This optiPoint Attendant simultaneously serves as the intercept position. It is the destination for all incoming non-DID calls and calls which the call-allocation algorithms are unable to route to users (intercept calls). The attendant routes these calls to the correct destination.

Standard key assignment (default) for optiPoint Attendant



Service	Night service
Number redial	Internal Phonebook
Microphone on/off	Queued calls
Loudspeaker	Override
	Hold
	External 1
	External 2
	Disconnect

Figure 10-34 optiPoint 500 standard - Standard Key Assignment (Default) for optiPoint Attendant

Additional information can be found in the operating manual optiPoint Attendant for HiPath 3000/5000 which is contained on the “Electronic Operating Instructions” CD (see Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).

10.8.2 optiClient Attendant

Introduction

optiClient Attendant is a PC-based attendant console for HiPath 3000/5000, which can be used up to six times per system.

The optiClient Attendant can also be operated as a central attendant console in a HiPath 3000/5000 network.

The new version 7.0 replaces the previous optiClient Attendant V6.0 for all connection types ((V.24, USB and TCP/IP).

HiPath 3000/5000 V5.0 supports optiClient Attendant Version 7.0 or later. It is not possible to use earlier versions of optiClient Attendant.

Changes in comparison to version 6.0

- In the optiClient Attendant V7.0 installation package, all software components for TCP/IP-based operation are already included. In addition, only a HiPath ComScendo license is required to start up IP workpoint clients. This means that there is no need to market the optiClient†130 as a basis for an optiClient Attendant-based LAN.
- optiClient Attendant V7.0 is licensed centrally via HiPath License Management.
- The functional scope of Version 7.0 is the same as the last edition of optiClient AttendantV6.0. (Version 6.0.11).
- The operating systems Windows 98 and NT4.0 are no longer supported.
- Increased demand is placed on PC system properties (see below).

Main functions

- Display of queued calls with type, name and telephone number
- Acoustic message signaling with volume control
- Display of the switching state of source and target
- Answering of pending calls
- Selection of telephone directories:
  - Outlook Contacts
  - HiPath telephone directory
  - Internal Attendant telephone directory, based on Microsoft Access
  - LDAP on Microsoft Active Directory Server

  - Access to telephone directory CD
- Notebook function for saving and dialing call numbers
- Call statistics for incoming calls with sort function according to various criteria
- Convenient caller list with an almost unlimited number of entries, sorted according to date and time
- Additional functions such as hold keys, override, callback, conference, paging, speaker announcements, alarm signaling, view call charges, redial (last 10 dialed destinations)
- Online help under Windows
- Convenient configuration of individual features
- Service tools for diagnosis and protocols
- Simple installation routine
- User interface currently available in German, English, Dutch, Portuguese, Italian, French and Spanish
- Connection with charges for single calls with automatic display in the notebook (printable)
- Connection of a blind attendant console
- Use of busy lamp fields:
  - 140 names with 16 characters or 240 call numbers with 6 characters per busy lamp field
  - Up to three busy lamp fields can be displayed Optional connection of second monitor
  - Configuration of busy lamp fields to suit individual user requirements
  - BLF zoom with automatic font adjustment
  - Speed dialing via busy lamp field
  - Color display of station status: idle, calling, busy internal, busy external, diverted and do not disturb
  - Memo function for each BLF station for individual user information
  - Configuration of up to two representatives for each BLF station with dialing function
  - Sorting of the busy lamp field or parts of the busy lamp field according to call number or alphabetically
  - Name definition for BLFs
  - Definition of titles for groups of busy lamp field stations

optiClient Attendant V7.0 as central attendant console

optiClient Attendant can be used as a central attendant console in an IP network (max. 6 optiClient Attendant per network). To enable network-wide BLF functionality, all attendant consoles must be connected to one of the network's HiPath 3000 nodes and registered. This functionality is independent of the optiClient Attendant connection type (V.24, USB or TCP/IP). For the network-wide Busy Lamp Field function all decentralized systems send their station states (e.g. free or busy) to the central system, to which the optiClient Attendants are connected. Signaling takes place in the CorNet-IP protocol (CorNet-NQ protocol tunneled in H.323 via annex M1).

In an IP network, a maximum of 100 stations per node can be defined that send their status information to the central optiClient Attendant for display on the busy lamp field. The stations of the central system in the network (to which the optiClient Attendants are connected) can all be displayed on the busy lamp field of the central attendant console.

Note: The control of the network-wide busy signal via the optiClient Attendant is independent of the network-wide busy signal to the workpoints clients via HiPath 5000 Presence Manager.

Model-specific data

Topic	HiPath 3800	HiPath 3750 HiPath 3700	HiPath 3550 HiPath 3500	HiPath 3350 HiPath 3300	HiPath Com-Scendo service
Feature available in	x	x	x	x	x
Maximum number of connectable optiClient Attendants	6	6	4	4	6

Connection variants for Microsoft operating systems

Connection variant	Windows®2000	Windows®XP
optiset E control adapters	Yes	Yes
Integrated USB interface (optiPoint 500 and optiPoint 600 office)	Yes	Yes
TCP/IP via HG 1500	Yes	Yes

Additional Microsoft operating systems are not supported.

System requirements

> If the licensing components - Customer License Agent (CLA) and Customer License Manager (CLM) - are to be installed on the same PC, their system requirements are also to be taken into account.

- Pentium III 750 MHz or higher
- Min. 128 MB RAM (memory)
- Graphics resolution min. 1024 x 768 pixels
- Sound card with speaker for ringer signaling
  In the case of Windows®2000, the following configuration must be carried out for signaling via the sound card: Select`Start/Settings/Control Panel/Sounds and Multimedia/Sounds` and activate "Only use preferred devices".
- Microsoft-compatible mouse
- CD-ROM or DVD drive
- Min. 40 MB free hard disk memory
- Windows®2000 or Windows®XP operating system
- For operation with a TCP/IP connection: Functional operating system with network and sound card configured
- For operation on USB: optiPoint 500 telephone or optiPoint 600 office with free USB interface, USB cable (part number S30267-Z360-A30-1), USB driver (Call-Bridge TU software) and a free USB port on the PC.
- For operation using optiset E control adapters: optiset E telephone with free adapter slot and a free port on the PC (COM port 1-4).

Licensing

A license is required for optiClient Attendant V7.0. The product is licensed centrally via HiPath License Management.

Information on the licensing procedure can be found in Section 8.5.

Configuration and operation

Information on installation can be found in the Readme file on the optiClient Attendant product software CD.

The optiClient Attendant operating instructions are described in detail in the optiClient Attendant Operating Manual for HiPath 3000/5000 which is on the "Electronic Operating Instructions" CD (see Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).

10.9 Mobile Telephones for HiPath Cordless Office

The following are examples of the mobile telephones approved for HiPath Cordless Office. For further information, refer to the appropriate operating instructions and the HiPath Cordless Office service manual.

10.9.1 Gigaset S1 professional

Gigaset S1 professional is a cordless telephone based on the digital DECT/GAP standard.

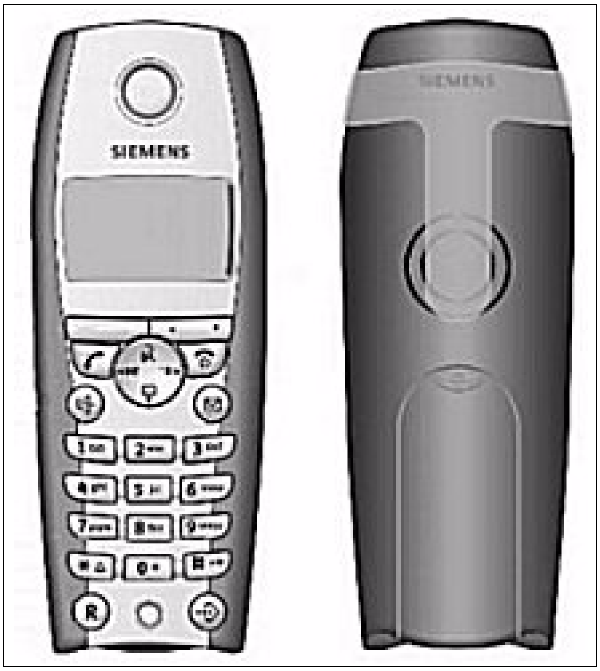


Figure 10-35 Gigaset S1 professional

Technical Specifications

- Ranges:
  - Outdoors: up to 300 m
  - Indoors: up to 50 m
- Operating times:
  - Standby: up to 170 hours
  - Talk time: up to 13 hours
- Dimensions (L × W × D in mm): 147 × 54 × 26
- Weight (including battery cells): approx. 130 g

- Operating temperature (mobile telephone): +5 °C to +45 °C (41 °F to 113 °F)

10.9.2 Gigaset SL1 professional

Gigaset SL1 professional is a very handy and light (only 100 g) mobile telephone based on the digital DECT/GAP standard.

Figure 10-36 Gigaset SL1 professional

Technical Specifications

- Ranges:
  - Outdoors: up to 300 m
  - Indoors: up to 50 m
- Operating times:
  - Standby: up to 250 hours
  - Talk time: up to 15 hours
- Dimensions (L × W × D in mm): 114 × 47 × 22
- Weight (including battery cells): approx. 100 g
- Operating temperature (mobile telephone): +5 °C to +45 °C (41 °F to 113 °F)

10.9.3 Gigaset M1 professional

Gigaset M1 professional is a very robust mobile telephone based on the digital DECT/GAP standard. It is suitable for use in environments requiring telephones to be break- and shockproof and dust- and spray-resistant.

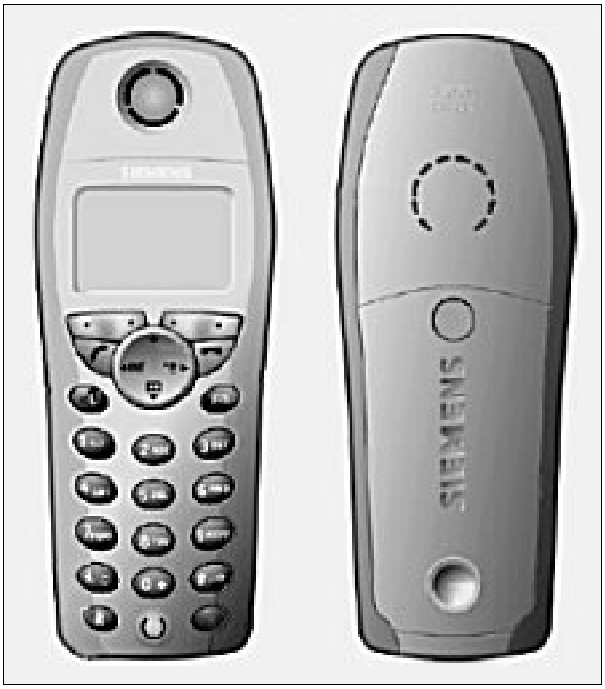


Figure 10-37 Gigaset M1 professional

Main Features

- Housing:
    - Spray-resistant (IEC 529 IP64)
    - Dustproof
    - Break- and shockproof
    - Silicon-free interface
    - Sturdy carry clip
- Interference resistance conforming to EN 50 082-2 (industry standard)
- Acoustics optimized for industrial environments

Technical Specifications

- Ranges:
  - Outdoors: up to 300 m
  - Indoors: up to 50 m
- Operating times:
  - Standby: up to 250 hours
  - Talk time: up to 15 hours
- Dimensions (L × W × D in mm): 150 × 57 × 25
- Weight (including battery cells): approx. 141 g
- Operating temperature (mobile telephone): –10 °C to +55 °C (14 °F to 131 °F)

10.9.4 Gigaset active M

Gigaset active M is a very robust mobile telephone based on the digital DECT standard. It is suitable for use in environments requiring telephones to be break- and shockproof and dust- and spray- resistant.

Main Features

- Housing:
  - Spray-resistant (IEC 529 IP64)
  - Dustproof
  - Break- and shockproof
  - Modified key layout (for use with protective gloves)
  - Illuminated display
  - Silicon-free interface
  - Sturdy carry clip
- Interference resistance conforming to EN 50 082-2 (industry standard)
- Acoustics optimized for industrial environments

Technical Specifications

- Ranges:
  - Outdoors: up to 300 m
  - Indoors: up to 50 m
- Operating times:
  - Standby: up to 250 hours
  - Talk time: up to 15 hours
- Dimensions (L × W × D in mm): 150 × 57 × 27
- Weight (including battery cells): approx. 141 g
- Operating temperature (mobile telephone): –10 °C to +55 °C (14 °F to 131 °F)

10.9.5 Gigaset active EX

In contrast to conventional mobile telephones, the explosion-proof DECT mobile telephone Gigaset active EX is designed for use in hazardous areas and is effectively protected against moisture and dirt.

Main Features

- Housing:
  - Explosion protection in accordance with EN 50 014 and EN 50 020 with T4 classification (II 2G EEx ib IIC T4)
  - Spray-resistant (IP64)
  - Dustproof
  - Break- and shockproof
  - Modified key layout (for use with protective gloves)
  - Silicon-free interface
  - Sturdy carry clip
- Interference resistance conforming to EN 50 082-2 (industry standard)
- Acoustics optimized for industrial environments

Technical Specifications

- Ranges:
  - Outdoors: up to 300 m
  - Indoors: up to 50 m
- Operating times:
  - Standby: up to 70 hours
  - Talk time: up to 7 hours
- Dimensions (L × W × D in mm): 160 × 55 × 25
- Weight (including battery cells): approx. 160 g
- Operating temperature (mobile telephone): –10 °C to +40 °C (14 °F to 104 °F)

10.9.6 Logging Mobile Telephones On To the System

Introduction

Sixteen mobile telephones are released for use by entering the HiPath cordless system number (DECT identification, 8 hexadecimal places) and inserting the SLC16 or SLC16N in HiPath 3750, HiPath 3700, or HiPath 3550, after which they can be logged on (mobile telephone codes, or PINs, are assigned). Other mobile telephones must be released before they can be used.

> For initial installation of the HiPath Cordless Office, the HiPath cordless system number must be ordered together with the SLC16/SLC16N board. Replacement boards are always delivered without a HiPath cordless system number.

Before logging on a mobile phone, you must open the login window from a system telephone (Assistant T) by entering the code and password. A maximum of 10 login windows can be open at a time.
Then type the station numbers of the mobile telephones you want to log on.

10.9.6.1 Opening the HiPath 3000 Login Window

Entry	Activity	Display
*94 2 19970707	Open the login window	Station no.:
124	Type the station number of the handset you want to log on (such as 124)	Station no.:
125	Type the station number of the second handset you want to log on (such as 125)	Station no.:
: :	: :	: :

The login window remains open for ten minutes per station. The handset must log on during this period (refer to Page 10-105).

10.9.6.2 Logging On the Mobile Telephone

Example: log the mobile telephone (station number “125”) on to the DECT telephone system 2 using mobile telephone PIN “11112345”.

Step	Entry or Key	Handset Display
1.	Switch on the mobile telephone by holding down the hook key for at least 1 second. You hear a confirmation tone.	The first time you log on, the message "Register?" appears on the handset display. The second time you log on, "Base 1" or a similar message flashes.
2.	Make the following entries within one minute. Press the menu key.	
3.	Select a station[1] (for example: Base 2) and confirm.	**Base 2**
4.	Open the add-on menu.	
5.	Select “Register” and confirm your choice.	The following prompt appears: “Please enter PIN:”
6.	Enter the eight-digit PIN (mobile telephone code) “11112345” and confirm.	“11112345”
7.	Once you have logged on properly, "Base 2" or a similar message appears and the bell symbol "《🔔》" flashes.	**Base 2**

[1] Base = DECT telephone system

After logging on and releasing a handset, always turn on the out-of-range warning signal. For more information, refer to the operating instructions (see Section 1.6, “Information on the Intranet”: Electronic Documentation on Com ESY Products).

10.9.6.3 Checking the Login Status of the Mobile Telephones

The current login status of mobile telephones can be checked using HiPath 3000 Manager E in the system view (“Cordless ...” dialog in the “Options” menu) and the station view.

10.9.6.4 Replacing, Locking, and Logging Off a Mobile Telephone

If you need to replace a handset for servicing, you must change the mobile telephone code (PIN) of the old handset before logging on the replacement telephone.

> When you replace a mobile telephone, the station must be assigned a new mobile telephone code (PIN) in the HiPath 3000system. This automatically logs off the mobile telephone.
> This also prevents a person who knows the old PIN to log on an invalid mobile telephone.

10.10 Analog Telephones for HiPath 3000

You can connect dial pulsing (DP) and DTMF telephones (such as group 3 fax machines and modems, answering machines, or entrance telephones) to the analog ports in the HiPath 3000.

Boards for connecting analog telephones

System	HiPath 3800	HiPath 3750 HiPath 3700	HiPath 3550 HiPath 3500	HiPath 3350 HiPath 3300
Hardware requirements	Free analog port on SLMA/8	Free analog port on SLA8N/16N/24N	Free analog port on CBCC CBRC 4/8/16SLA 8SLAR SLA8N/16N/24N	Free analog port on CBCC CBRC 4/8SLA 8SLAR

Refer to Section 9.2.2 for information on upgrading peripheral boards for HiPath 3750 and HiPath 3700.

Connecting equipment using an optiPoint analog adapter

It is also possible to connect an analog telephone to an existing optiPoint 500 telephone with the optiPoint Analog Adapter (except for optiPoint 500 entry and optiPoint 500 economy).

10.11 ISDN Terminals for HiPath 3000

An S_0 bus in the HiPath 3000 system family can support up to eight ISDN terminals. Each terminal can be dialed selectively under its multiple subscriber number or station number.

The features that can be activated depend on the type of S_0 terminal used. Different ISDN features are supported depending on the terminal used. Analog station users can activate system features by means of code procedures. The telephones support only those system features which can be activated in the idle state.

The dialing behavior of ISDN terminals corresponds to that of DP terminals. The substitute codes “75” and “76” can be used for the characters “*” and “#” which cannot be used in the ISDN protocol.

Boards for connecting ISDN terminals

System	HiPath 3800	HiPath 3750 HiPath 3700	HiPath 3550 HiPath 3500	HiPath 3350 HiPath 3300
Hardware requirements	Free S_0 port on STMD3	Free S_0 port on STMD8	Free S_0 port on CBCC CBRC STLS2/4 STLS4R STLSX2/4 STLSX4R	Free S_0 port on CBCC CBRC STLS2/4 STLS4R STLSX2/4 STLSX4R

Refer to Section 9.2.2 for information on upgrading peripheral boards for HiPath 3750 and HiPath 3700.

Connecting with an optiPoint ISDN adapter

It is also possible to connect an ISDN device to an existing optiPoint 500 telephone using an optiPoint ISDN Adapter (except for optiPoint 500 entry and optiPoint 500 economy).

11 HiPath Cordless Office

This chapter contains basic information about the operation of HiPath Cordless Office. For more detailed information, please refer to the HiPath Cordless Office service manual.

11.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Introduction, page 11-2
System Configuration, page 11-3
Technical Data for Base Stations, page 11-4
Power-Related Capacity Limits, page 11-6
Multi-SLC and System-Wide Networking, page 11-10
Planning Notes for Networked HiPath 3000 Systems Featuring Network-Wide Roaming, page 11-12

11.2 Introduction

For HiPath 3000 V1.2 and later, HiPath Cordless Office can be used on all systems of this product line.

Direct connection

The BS3/1 (S30807-H5482-X) and BS4 (S30807-U5491-X) base stations can be connected directly to the $U_{P0/E}$ interfaces on the central control boards in the HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300. The connection must be made via one $U_{P0/E}$ interface each. A mix of base stations of types BS3/1 and BS4 is supported.

A BS3/S (X30807-X5482-X100) single-cell base station can be used to ensure the operation of a maximum of one base station at the $U_{P0/E}$ interfaces on central control boards in the HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300. In this case, it is not possible to expand with additional base stations.

However, base stations cannot be simultaneously connected to the SLC16/SLC16N board and the CBCC within one HiPath 3550 system.

Connecting cordless boards

Base stations can be connected to the $U_{P0/E}$ interfaces of the following cordless boards:

- SLC16 and SLC16N in HiPath 3750, HiPath 3550 and HiPath 3700.
- SLCN in HiPath 3800

A mix of base stations of types BS2/2 (S30807-H5471-X200), BS3/1 (S30807-H5482-X), BS3/3 (S30807-H5485-X), and BS4 (S30807-U5491-X) may be used on the above cordless boards.

You can install up to four SLC16 or SLC16N boards in HiPath 3750 and HiPath 3700 and up to four SLCN boards in HiPath 3800. All four boards provide full cordless functionality (roaming and seamless connection handover) because the radio fields on the cordless boards are synchronized within a single system (see Section 11.6).

SLC16 and SLC16N can be used in mixed mode within a HiPath 3750 and HiPath 3700.

The HiPath 3000 product line does not currently support the network-wide handover feature.

11.3 System Configuration

The following table indicates the maximum possible system configuration parameters for HiPath Cordless Office. It also shows when

- CMA or CMS is necessary
- analog trunk access is possible.

Table 11-1 HiPath Cordless Office - System Configuration for HiPath 3000 V5.0

System	**Max. no.**			**Clock modules**	**Maximum number of base stations BS with connection via 1xU$_{P0/E}$**					**Simultaneous calls per BS**					**Max. no. MTs**	**Analog trunk access to system**
	SLC16	**SLC16N**	**SLCN**		**BS3/1**	**BS3/S**	**BS2/2**	**BS3/3**	**BS4**	**BS3/1**	**BS3/S**	**BS2/2**	**BS3/3**	**BS4**		
HiPath 3350 HiPath 3300	–	–	–	CMS	–	1	–	–	–	–	2	–	–	–	8	No
	–	–	–	CMA	–	1	–	–	–	–	4	–	–	–	8	Yes
	–	–	–	CMA	3	–	–	–	3	4	–	–	–	4	16	Yes
HiPath 3550 HiPath 3500	–	–	–	CMS	–	1	–	–	–	–	2	–	–	–	8	No
	–	–	–	CMA	–	1	–	–	–	–	4	–	–	–	8	Yes
	–	–	–	CMA	7	–	–	–	7	4	–	–	–	4	32	Yes
HiPath 3550	1	1	–	CMS	16	–	8	8	16	4	–	8	12	12	64	Yes
HiPath 3750 HiPath 3700	4	4	–	CMS	64	–	32	32	64	4	–	8	12	12	250 (with 4 SLC16/ SLC16N)[1]	Yes
HiPath 3800	–	–	4	CMS	64	–	32	32	64	4	–	8	12	12	250 (with 4 SLCN)[2]	Yes

Explanations:

- BS2/2 (S30807-H5471-X200) is a base station that supports a maximum of 8 calls when connected using two U$_{P0/E}$ interfaces.
- BS3/1 (S30807-H5482-X): is a base station that supports a maximum of 4 calls.
- BS3/3 (S30807-H5485-X): is a base station that supports a maximum of 12 calls when connected using three U$_{P0/E}$ interfaces.
- BS3/S (X30807-X5482-X100): The BS3/S single-cell base station guarantees the operation of a maximum of one base station on the U$_{P0/E}$ interfaces of the central board. It is not possible to operate additional base stations.
- BS4 (S30807-U5491-X): is a base station that supports a maximum of 12 calls when connected using three U$_{P0/E}$ interfaces. In the case of a direct connection, it is only permitted to make the connection via one U$_{P0/E}$ interface. The B channels in the base station BS4 require a license (see Chapter 8).

[1] Up to 128 handsets are possible at an SLC16 or SLC16N.

[2] Up to 128 MTs are possible at an SLCN.

11.4 Technical Data for Base Stations

Table 11-2 Technical Data for Various Base Stations

Parameter	BS3/1 and BS3/S	BS3/3	BS4	Outdoor cover
Power supply voltage range	42 to 54 V	42 to 54 V	42 to 54 V	–
Power consumption	max. 1.7 W	max. 3.2 W	max. 3.0 W	–
Housing dimensions (W x D x H in mm)	181 x 139 x 69	202 x 172 x 43	200 x 176 x 49	296 x 256 x 90
Weight	approx. 0.3 kg	approx. 0.5 kg	approx. 0.5 kg	approx. 1.0 kg
Temperature range	for indoor use: - 5 to + 50 °C			for outdoor use: - 20 to + 45 °C
Relative humidity	–	–	–	up to 95%

BS3/1 base station

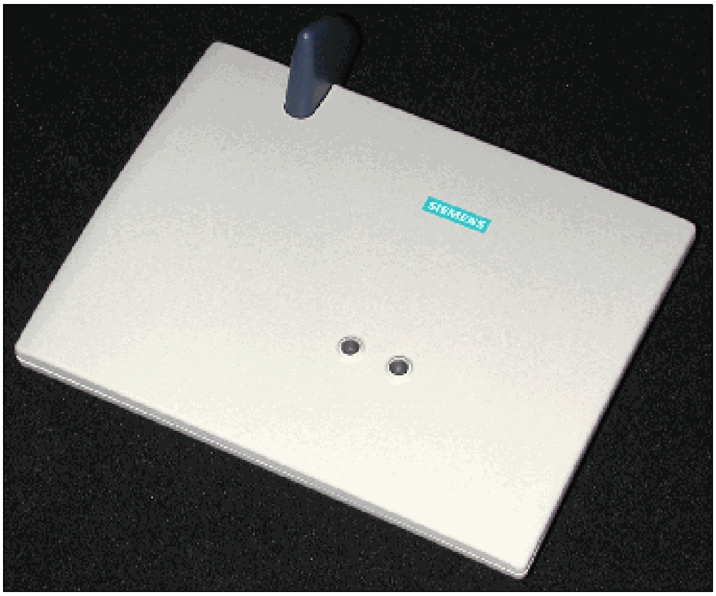
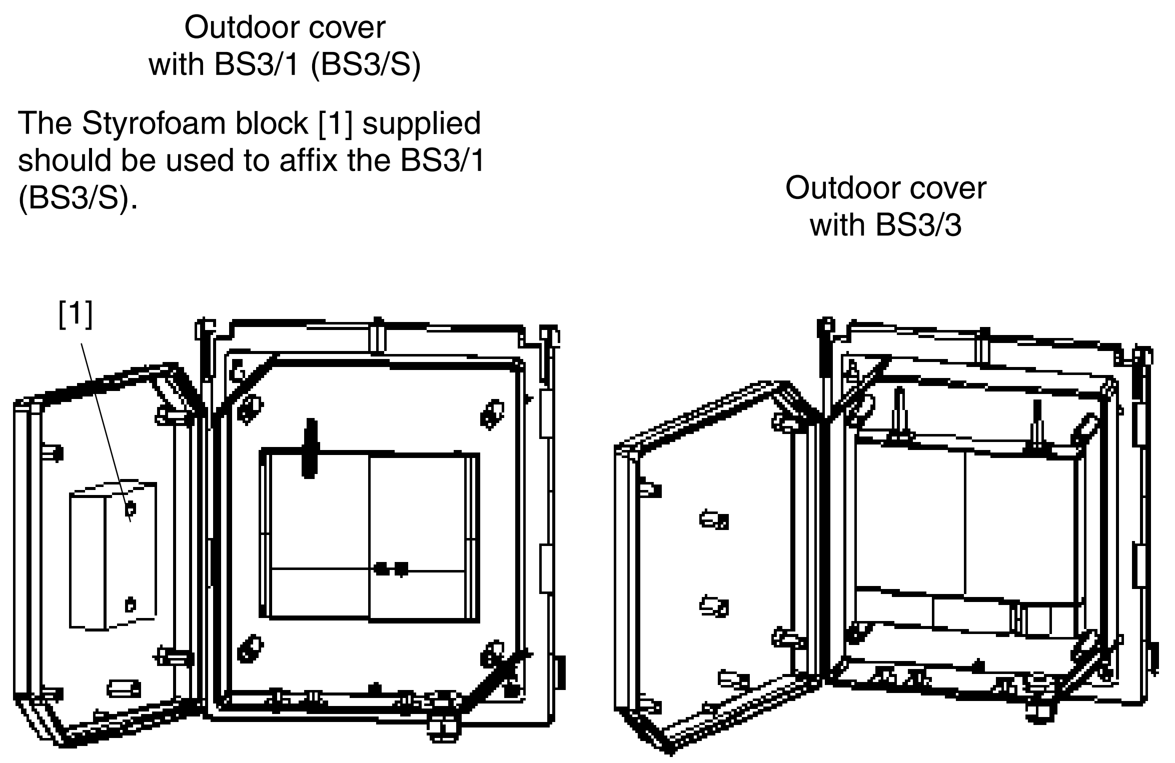


Figure 11-1 BS3/1 S30807-H5482-X Base Station

Outdoor cover

A base station must be installed in a weatherproof outdoor cover to guarantee radio coverage outdoors, for example on factory premises. The outdoor cover is suitable for mounting on walls of buildings, roofs, and masts.

The outdoor cover S30122-X7469-X already available for BS2/2 is also used for the new base stations BS3/1 (BS3/S), BS3/3 and BS4. The only difference is that you do not need a heater for BS3/1 (BS3/S), BS3/3 and BS4.



The Styrofoam block [1] supplied should be used to affix the BS3/1 (BS3/S).

Figure 11-2 BS3/1 (BS3/S) and BS3/3 in the Outdoor Cover S30122-X7469-X

For information on the various outdoor cover mounting options, refer to the HiPath Cordless Office Service Manual.

11.5 Power-Related Capacity Limits

The number of base stations, their distance from the system, and the overall telephone configuration determine whether or not the output from the internal system power supply units is sufficient or whether an additional supply is necessary.

- HiPath 3800
  If the correct number of LUNA2 modules was calculated, the system's internal power supply unit provides sufficient power to supply the system configuration specified in Table 11-1.
  For information on how to calculate the number of LUNA2 modules required, see Page 3-62.
- HiPath 3750 and HiPath 3700
  The system's internal power supply unit provides sufficient power to supply the system configuration specified in Table 11-3.

Table 11-3 HiPath 3750, HiPath 3700 - Maximum Number of SLA16N and SLMO24 Subscriber Line Modules Depending on the Number of Base Stations Connected to SLC16 or SLC16N

HiPath 3750 HiPath 3700	**Number of SLC16 SLC16N**	**Number of base stations**		**Number of SLA24N SLMO24**
		BS3/1 BS4 connected via 1xU$_{P0/E}$	**BS2/2 BS3/3 BS4 connected via 2xU$_{P0/E}$**	
BC	0	0	0	7
	1	16	8	5
	2	32	16	3
Expansion cabinet	0	0	0	8
	1	16	8	6
	2	32	16	4
	3	48	24	2
	4	64	32	0

- HiPath 3550 and HiPath 3500
  The following tables show which telephone configurations do not need an additional power supply:
  - Table 11-4, depending on the number of BS3/1 base stations connected to the central CBCC/CBRC control board.
  - Table 11-5, depending on the number of BS3/1 base stations connected to SLC16 or SLC16N.
  - Table 11-6, depending on the number of BS2/2 base stations connected to SLC16 or SLC16N.
  - Table 11-7, depending on the number of BS3/3 base stations connected to SLC16 or SLC16N.

  If extra telephone configurations are added to these, an additional power supply (by EPSU2 or EPSU2-R) is needed.

Table 11-4 HiPath 3550, HiPath 3500 - Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to CBCC or CBRC

Number of BS3/1s and BS4s connected via 1x$U_{P0/E}$ to CBCC or CBRC	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
1	66	61	57	53	48	44
2	63	59	54	50	46	41
3	60	56	52	47	43	39
4	58	53	49	45	40	36
5	55	51	47	42	38	33
6	53	48	44	40	35	31
7	50	46	41	37	33	28

Table 11-5 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16 or SLC16N

Number of BS3/1s and BS4s connected via 1x$U_{P0/E}$ to SLC16 or SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
1	66	61	57	53	48	44
2	63	59	54	50	46	41

Table 11-5 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16 or SLC16N

Number of BS3/1s and BS4s connected via 1xU$_{P0/E}$ to SLC16 or SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
3	60	56	52	47	43	39
4	58	53	49	45	40	36
5	55	51	47	42	38	33
6	53	48	44	40	35	31
7	50	46	41	37	33	28
8	47	43	39	34	30	26
9	45	40	36	32	27	23
10	42	38	33	29	25	20
11	40	35	31	27	22	18
12	37	33	28	24	20	15
13	34	30	26	21	17	13
14	32	27	23	19	14	10
15	29	25	20	16	12	7
16	27	22	18	13	9	5

Table 11-6 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS2/2 Base Stations Connected to SLC16 or SLC16N

Number of BS2/2s On SLC16 or SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
1	63	59	54	50	46	41
2	58	53	49	45	40	36
3	53	48	44	40	35	31
4	47	43	39	34	30	26
5	42	38	33	29	25	20
6	37	33	28	24	20	15
7	32	27	23	19	14	10
8	27	22	18	13	9	5

Table 11-7 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS3/3 Base Stations Connected to SLC16 or SLC16N

Number of BS3/3s and BS4s connected via 2xU$_{P0/E}$ to SLC16 or SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiset E and optiPoint 500 telephones					
1	64	60	56	51	47	42
2	60	56	52	47	43	39
3	57	52	48	43	39	35
4	53	48	44	40	35	31
5	49	44	40	36	31	27
6	45	40	36	32	27	23
7	41	37	32	28	23	19
8	37	33	28	24	20	15

When using an additional power supply (such as EPSU2 or EPSU2-R), HiPath 3550 and HiPath 3500 can be expanded up to the maximum possible capacity limit specified in Table 2-7.

Supplying power to base stations

The internal power supply unit in the respective system is the main power source for the base stations. For more information on the various power supply options, please refer to Page 3-147.

11.6 Multi-SLC and System-Wide Networking

Multi-SLC (HiPath 3800, HiPath 3750, HiPath 3700) and system-wide networking (HiPath 3800, HiPath 3750, HiPath 3550, HiPath 3350, HiPath 3700, HiPath 3500, HiPath 3300)

You can install up to four SLC16 or SLC16N boards in HiPath 3750 and HiPath 3700 and up to four SLCN boards in HiPath 3800. For the total cordless station mobility (roaming and seamless connection handover) within a system, the radio fields of these cordless boards are synchronized.

The system views each mobile telephone (mobile station) as a corded telephone. During administration, a fixed port on the system's "home cordless board" is assigned to the MT; this is used for addressing the MT.

As soon as an MT moves into the area of a different radio switching location ("current-location cordless board"), an extension connection is switched using a DSS1 connection initiated by the cordless board. The home and current-location cordless boards exchange a networking protocol (User-to-User Signaling UUS) over this extension connection to support full mobility (see Figure 11-3).

This function can be used not only within one system, but also among systems (among nodes) because the CorNet NQ used for networking supports the UUS protocol (note: for the system-wide extension connections, you may have to take additional B channels into consideration for the permanent connection paths (CorNet NQ, see Section 11.7). That means full mobility across the radio fields of the different cordless systems. All handset features (callback, team functions, voicemail, etc.) remain intact. The network-wide handover feature is only exception here as it is not currently supported.

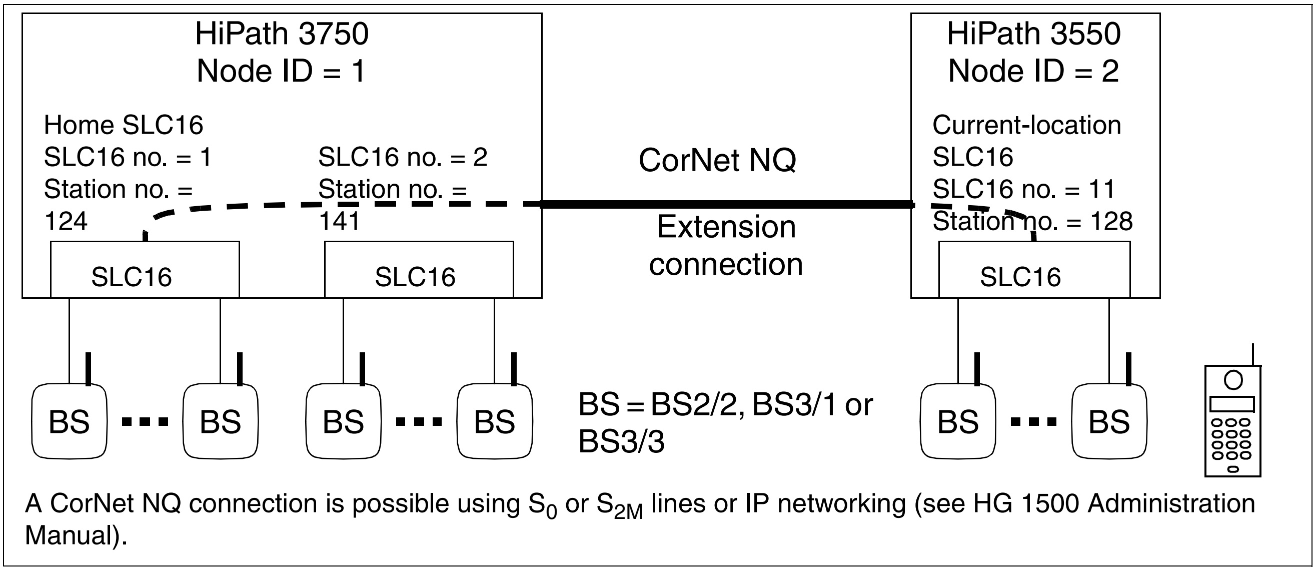
Required B channels

Table 11-8 Required B channels for Multi-SLC and System-Wide Networking

Mobile telephone (MT) has set up a connection	Required B channels	Required B channels for the home cordless board	Required B channels for the current-location cordless board
In the home cordless board range	1	1	–
In the current-location Cordless board range	3	2	1
Handover from home to home cordless board	1	1	–
Handover from home to current-location cordless board	3	2	1

Table 11-8 Required B channels for Multi-SLC and System-Wide Networking

Mobile telephone (MT) has set up a connection	**Required B channels**	**Required B channels for the home cordless board**	**Required B channels for the current-location cordless board**
Handover from current-location to current-location cordless board	5 (temporary)	3	2 (1 for each cordless board)


HiPath 3750
Node ID = 1
Home SLC16
SLC16 no. = 1
Station no. = 124
SLC16 no. = 2
Station no. = 141
SLC16
SLC16
CorNet NQ
Extension connection
HiPath 3550
Node ID = 2
Current-location SLC16
SLC16 no. = 11
Station no. = 128
SLC16
BS
BS
BS
BS
BS = BS2/2, BS3/1 or BS3/3
BS
BS

A CorNet NQ connection is possible using S_0 or S_{2M} lines or IP networking (see HG 1500 Administration Manual).

Figure 11-3 Example of a Cordless Extension Connection in Networked Systems

Networked HiPath 3000 systems feature

- max. 64 networked systems
- accessible using a shared station number (roaming among the systems/nodes)
- call interruption when changing between systems/nodes

11.7 Planning Notes for Networked HiPath 3000 Systems Featuring Network-Wide Roaming

The demand for additional B channels for fixed connection paths (CorNet NQ) must be taken into account for the system-wide extension connections described in Section 11.6.

If the “Network-wide roaming” feature is used, please ensure that there is no overlapping in the radio areas of individual systems with identical DECT IDs. Handsets treat networked systems with identical DECT IDs as a single system.

If the radio areas of systems with identical DECT IDs overlap, mobile telephones inadvertently try to perform network wide handover, which results in communication breakdown.

If networking is required for systems in which the individual radio fields overlap (for example, to increase capacity limits or through decentralized installation), different DECT IDs must be configured in the individual systems. Network-wide roaming does not apply in this case.

The following describes three different scenarios for networked HiPath 3000 systems.

Scenario 1: Incorrect DECT Configuration of Networked HiPath 3000Systems

Identical DECT IDs and overlapping radio areas result in incorrect handover causing a breakdown in communication.

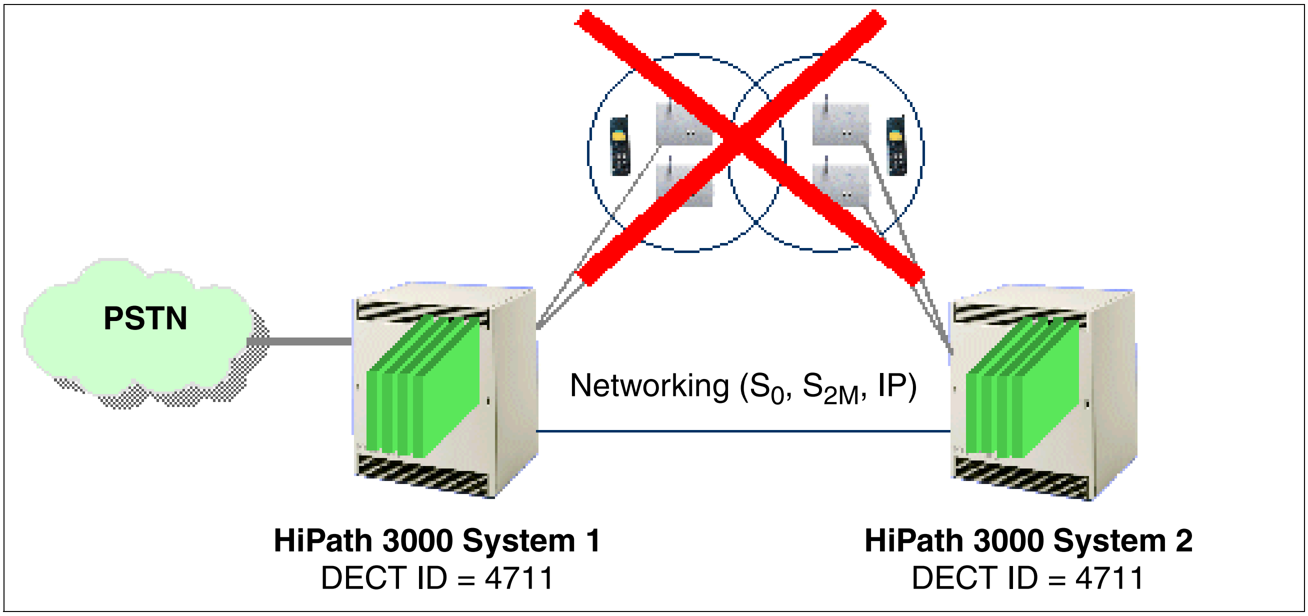


Figure 11-4 Incorrect DECT Configuration of Networked HiPath 3000 Systems

Scenario 2: Correct DECT Configuration when Networking HiPath 3000 Systems

No incorrect handover due to identical DECT IDs despite overlapping radio areas. Disadvantage: network-wide roaming not possible.

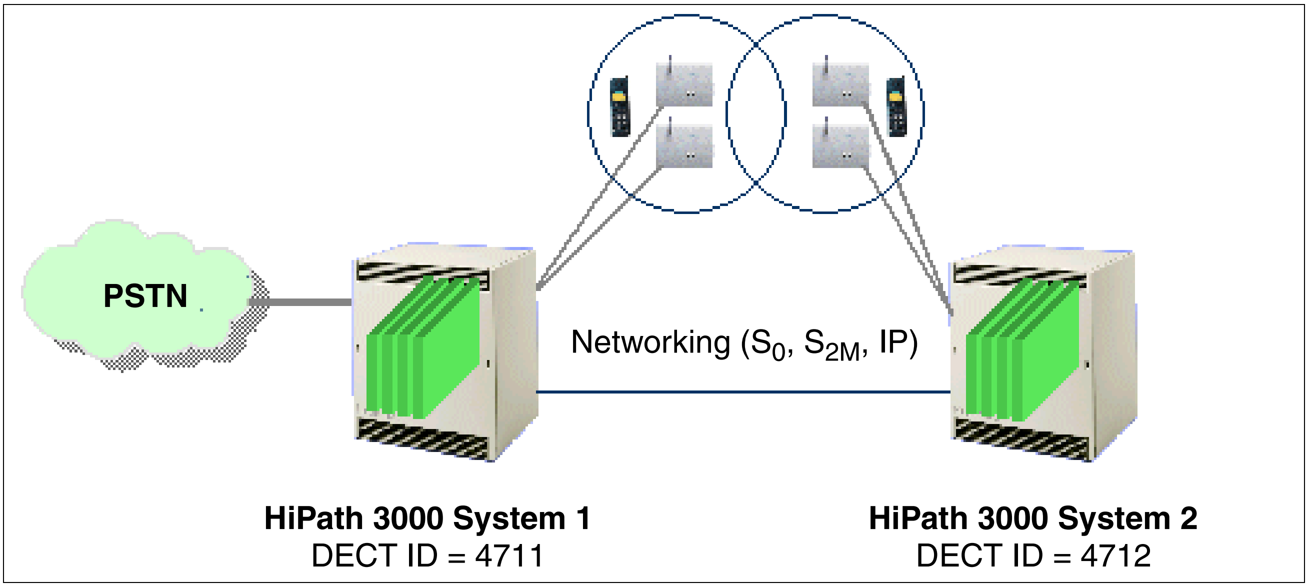

PSTN
Networking (S_0, S_{2M}, IP)
HiPath 3000 System 1
DECT ID = 4711
HiPath 3000 System 2
DECT ID = 4712

Figure 11-5 Correct DECT Configuration when Networking HiPath 3000 Systems

Scenario 3: Correct DECT Configuration when Networking HiPath 3000 Systems

No incorrect handover despite identical DECT IDs as the radio areas do not overlap. Network-wide roaming possible.

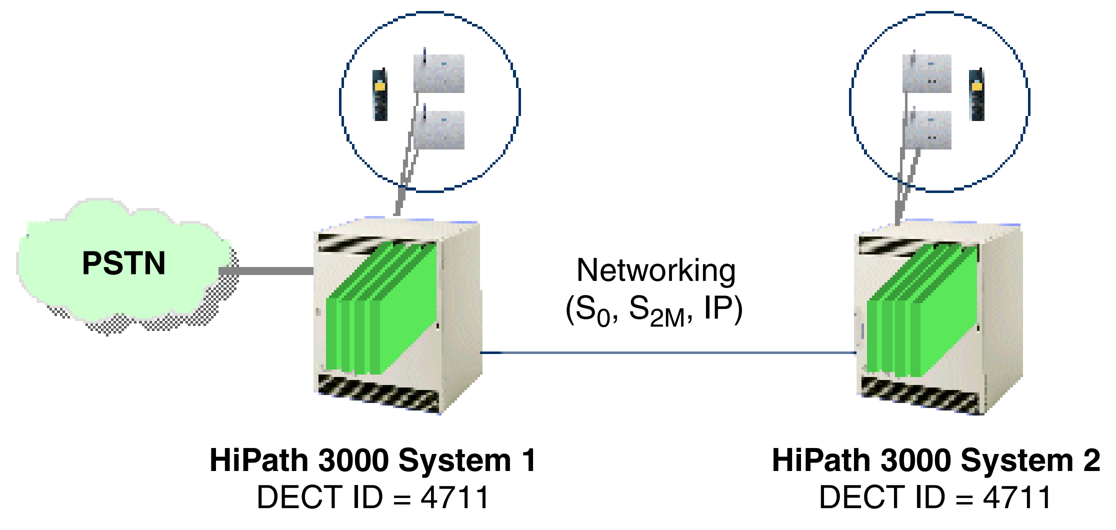

PSTN
Networking
(S_0, S_{2M}, IP)
HiPath 3000 System 1
DECT ID = 4711
HiPath 3000 System 2
DECT ID = 4711

Figure 11-6 Correct DECT Configuration when Networking HiPath 3000 Systems

12 Service

12.1 Overview

Introduction

This chapter contains information on the options available to service technicians and customers for

- performing service and maintenance work.
- recognizing and correcting errors.

Such work can be performed on site or using remote service.

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
Service and Maintenance Tasks, page 12-3:
● Backing Up the Customer Database (CDB Backup), page 12-3
● Effects of Hardware Changes on Customer Data, page 12-8
● Relocate/Transfer Application Processor Software (APS), page 12-11
● Upgrading HiPath 3000, page 12-17
● Determining System Information and Installed Software Components (HiPath Inventory Manager), page 12-18
● Backing Up System Components (Backup Manager), page 12-19
● HiPath User Management (not yet released), page 12-21
Guided Maintenance, page 12-23:
● Diagnosis Options, page 12-23
● HiPath 3000 Error Messages (Entries in the Eventlog for HiPath 3000), page 12-48
● HiPath 5000 Error Messages (Event Viewer Entries for HiPath 5000), page 12-57
Correcting Errors, page 12-70:
● Automatic Error Correction, page 12-70
● Manual Error Correction Without HiPath 3000 Manager E, page 12-70
● Manual Error Correction With HiPath 3000 Manager E, page 12-71

Topic
Remote Service, page 12-72:
● HiPath 3000 Connection Options, page 12-73
● HiPath 5000 Connection Options, page 12-74
● Remote System Administration, page 12-74
● Remote Correction of System Software (APS), page 12-75
● Remote Error Signaling, page 12-76
● Controlled Release of a Remote Connection, page 12-77
● Remote Administration and Access Using PPP, page 12-77
Security Features, page 12-79:
● Access Security, page 12-79
● Automatic Logging of Administration Procedures, page 12-86

12.2 Service and Maintenance Tasks

12.2.1 Backing Up the Customer Database (CDB Backup)

A distinction is made here between

- backup of customer data **without** HiPath Software Manager and
- backup of customer data **with** HiPath Software Manager.

12.2.1.1 Customer Data Backup Without HiPath Software Manager

Definition

CDB backup refers to saving the customer database (CDB) to the multimedia card MMC (HiPath 3000) or copying the cyclic RAM data and saving it in two PDS (Permanent Data Service) files (HiPath 5000).

Note: The RUN LED flashes repeatedly for a short period to signal that a CDB backup, which takes about 30 seconds, is in progress on the MMC.

12.2.1.1.1 Automatic Customer Data Backup

HiPath 3000

A two-stage concept guarantees automatic customer data backup.

A complete CDB backup version can be found on the MMC at any time. Deltas for this backup are stored in an SRAM area (with battery backup) in the central control board. If the SRAM area is full, the customer data is automatically backed up. This means that the entire CDB, including SRAM content, is copied from the SDRAM in the central control board to the MMC. The current CDB is simultaneously stored on the MMC along with the “old” CDB, which is not deleted until the current CDB is completely stored on the MMC.

In case of a power outage, the SDRAM content that has no battery backup is completely lost. However, by re-accessing the CDB backup on the MMC, the system’s database can be restored to the state it was in prior to the power outage.

Regardless of the volume of changes to the database, HiPath 3000 always automatically performs a complete CDB backup at midnight, system-time.

HiPath 5000

On the communication server, RAM data is copied automatically every three minutes and stored in the file `hicom.pds`. This file contains the complete data description of the HiPath 5000 with emulated HG 1500 boards. This includes:

- customer data
- trace
- error history
- call charge data
- status data

The directory in which the two PDS files are to be stored must be defined when the HiPath 5000 software is installed (setup). The two PDS files are created when the HiPath 5000 is started for the first time.

> The PDS files must not be modified, as reading of the files using conventional tools and interpretation of the content is not possible without specialist knowledge.
> In the event of an error, the PDS files can be made available to the responsible Service Support contact for diagnostic purposes. The `*.trc` and `*.dmp` files stored in the `diag` subdirectory of the installation directory should also be supplied.

12.2.1.1.2 Manual Customer Data Backup with HiPath 3000

You can perform a manual CDB backup using HiPath 3000 Manager E (in online mode) or Assistant T.

However, be aware that it is not possible to deliberately abort a manual backup that is initiated using Assistant T. Once the CDB backup process starts, it should be ended because the backup continues to run in the background.

You can also manually initiate a CDB restore, including the call detail data, from the MMC.

Procedure: Manual CDB backup, system restore using Assistant T

Step	Activity
Manual customer data backup on the MMC	
1.	Assistant T: Start system administration
2.	Menu 28 -> Edit CDB
3.	Menu 28-2 -> Back up CDB data
4.	Menu 28-2-1 -> CDB on MMC
Loading the saved customer data from the MMC into the system	
1.	Assistant T: Start system administration
2.	Menu 28 -> Edit CDB
3.	Menu 28-2 -> Back up CDB data
4.	Menu 28-2-2 -> CDB from MMC **Caution:** When performing this action, the system performs a hard restart.

12.2.1.2 Customer Data Backup with HiPath Software Manager

Definition

The HiPath Software Manager supports, among other things, the backup of customer databases (Backup Manager) from all HiPath 3000/5000 systems in the same customer network (see also Section 12.2.6, “Backing Up System Components (Backup Manager)”).

The CDB backups are stored in a directory which must be defined in advance. The data backup can either be started manually immediately or performed at a predefined time. A cyclic backup, which saves the customer data at a set time every day, is also possible.

Refer to the help provided with the HiPath Software Manager for information on backing up customer data with this tool.

12.2.1.3 CDB Treatment When Replacing Central HiPath 3000 Hardware

When replacing a central control board due to a hardware defect, for example, the following options are available for handling the CDB:

- **Procedure: After replacing the board, load the "current" CDB to the system**

Step	Activity
1.	Copy the current CDB and save it on the MMC.
2.	Disconnect the system from the power supply.
3.	Remove the MMC.
4.	Replace the central control board.
5.	Insert the MMC.
6.	Restart the system by plugging in the power plug.
7.	The CDB previously stored on the MMC is loaded to the system RAM. The customer system is now configured: ● The CMI mobile telephones are logged on. ● The V.24 baud rate is set up. ● The ACD login port is configured. ● All telephone options, such as volume and display, are determined per station.

- **Procedure: After replacing the board, load the "old" CDB from the customer disk to the system**

Step	Activity
1.	Back up current CDB with HiPath 3000 Manager E.
2.	Disconnect the system from the power supply.
3.	Remove the MMC.
4.	Replace the central control board.
5.	Insert the MMC.
6.	Restart the system by plugging in the power plug.
7.	Reload.
8.	If an “older” CDB update is imported, reload the CDB into the system without the Delta mode. The “hardware and CDR switch” remain inactive.
9.	Reset. The customer system is now configured. All you have to do now is ● log on the CMI mobile telephones again, ● reset the V.24 baud rate, ● re-configure the ACD login port, ● redefine all telephone configurations, such as volume and display, per station.

12.2.2 Effects of Hardware Changes on Customer Data

Any changes to the hardware must be made before creating a copy of the customer database using HiPath 3000 Manager E. You must ensure that the hardware configuration on the MMC of HiPath 3000 is always current.

Hardware changes include:

- removing or inserting boards (HiPath 3000 only).
- removing or inserting telephones.
- removing or inserting add-on devices or adapters.

12.2.2.1 Inserting and Removing HiPath 3000 Boards

⚠ **Caution**
When using HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300, disconnect the system from the power supply before removing or inserting boards.
Only HiPath 3800, HiPath 3750 and HiPath 3700 peripheral boards can be removed or inserted during operation.

Startup rules for inserting and removing boards

Table 12-1 Startup Rules for Inserting and Removing Boards

If	Then
Inserting new board in free slot	Board is integrated into the system according to the rules for initial startup (Page 4-154). ● System with default numbering plan The station numbers from the new board are appended (consecutively and in ascending order) to the numbers already assigned. ● System with modified numbering plan The station numbers on the new board can be in any order. Using HiPath 3000 Manager E or Assistant T, you can assign a specific station to a port. If the number is already assigned to a different object, you can switch both numbers.
Replacing board with same or under equipped board type	Board is activated. The same station range is used.

Table 12-1 Startup Rules for Inserting and Removing Boards

If	Then
Replacing board with over-equipped board of same type	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available. In the case of subscriber line modules, you can use HiPath 3000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.
Replacing with a different board type	The system does not automatically activate the board. After removing the old board, you can delete it from the database using HiPath 3000 Manager E or Assistant T. After you have inserted the new board, the system activates it as if it had been inserted into a free slot. However, the CDB area used by the old board is left as a gap. In the case of subscriber line modules, you can use HiPath 3000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.

If you initiate a system reload on a system updated as described above, the system must be reset after the updated CDB has been installed. The reset synchronizes the port placement sequence in the system with that of the CDB.

Procedure: Exchanging boards

Step	Activity
1.	Disconnect system from power supply.
2.	Remove the board(s).
3.	Restart the system by plugging in the power plug.
4.	Delete board slot using user interface (29-4).
5.	Disconnect system from power supply.
6.	Insert new board(s).
7.	Restart the system by plugging in the power plug.
8.	Load customer data from the system. Adapt customer data to new hardware configuration. Insert new board(s), (stations, for example).
9.	Load new customer data into the system.

12.2.2.2 Exchanging Workpoint Clients

You can add or remove workpoint clients while the system is in operation. The data in the removed workpoint clients is retained.

In case of various optiPoint 500 or optiset E telephone models, meaning ones that have a different number of programmable keys, the keypad layout of the previous model is retained. Add-on devices that are not plugged in retain their technical features. With the HiPath 3000 Manager E, you can delete the add-on devices that are not plugged in and remove the keys that are no longer available.

12.2.3 Relocate/Transfer Application Processor Software (APS)

APS replacement/transfer is not possible with HiPath 5000. You must perform a complete software upgrade.

For system software updates, a distinction is made between

- HiPath 3000 systems **without** HiPath Software Manager and
- HiPath 3000 systems **with** HiPath Software Manager.

For networked HiPath 3000 systems with HiPath 5000 Server, an APS update can only be performed with HiPath Software Manager.

12.2.3.1 APS Replacement/Transfer for HiPath 3000 Systems Without HiPath Software Manager

Two memory areas are reserved for the application processor software on the MMC. To be able to store two complete APS and to keep the transfer time as low as possible, part of an APS is stored in a compressed format. The APS is decompressed after it has been transferred from the MMC to the SDRAM area of the central control board.

12.2.3.1.1 Transferring an APS of HiPath 3000 by Replacing the MMC

APS replacement is only possible within a version and if a logical, compatible CDB is available.

Procedure

Step	Activity
1.	Create a backup of the current CDB and save on a customer disk for security reasons.
2.	Remove MMC with “old” APS. The flashing Run LED (0.1 s on/0.1 s off) indicates that the MMC is missing. The system remains active for call processing.
3.	Install new MMC with “new” APS. The system creates an automatic CDB backup and thus saves the current customer database (CDB) to the new MMC.
4.	An automatic reset is then performed (hard restart for entire system with the current CDB).

Step	Activity
5.	Use the “APS stamp” to verify that the new APS has been activated. Use HiPath 3000 Manager E or Assistant T (menu item 29-1-2) to make the necessary query.

12.2.3.1.2 APS transfer

Options

The APS Transfer feature is available with the HiPath 3000 Manager E. It facilitates

- an **on-site APS transfer** by connecting directly using the V.24 interface.
- an **APS transfer via remote service** from a central service center using the integrated analog or digital modem or via LAN.

Function

This feature transfers the new APS in its entirety and stores it in the available area of the MMC. After the transfer, the checksum is analyzed. The system subsequently reports whether or not

- an error was found.
  If so, you have to delete the transferred APS.
- the APS transfer was successful.
  You can then activate the APS immediately or at a later time.

Resetting the system initiates the changeover from the old APS to the new APS. If problems occur during this process, the old APS is reactivated. Once the changeover is successful, the old APS is deleted from the MMC.

In case of power outage, the SDRAM content that has no battery backup and the active APS are completely lost. By re-accessing the current APS on the MMC, the system can be restored to the state it was in prior to the power outage.

Procedure

Step	Activity
1.	Save the existing customer data (for example: as "customer1.kds").
2.	Select “Open CDB” from the HiPath 3000 Manager E file menu and highlight “APS files (*.fst)”. Open the fst file using the new system software.
3.	Double-click the “Transfer” icon: Select the appropriate access and enter the PIN code.
4.	Highlight “APS Transfer”. A new window appears in the top right of the screen. You can use this window to select whether ● to change directly to the APS after the transfer is completed. ● to change to the APS at a pre-determined time. **Note:** If the “APS Transfer” field has a gray background, then the fst file was not opened correctly.
5.	Start the APS transfer. Transfer time for connection via digital modem (ISDN) or LAN is approximately 20 to 30 minutes. Connections via the IMODN analog modem or direct connections (V.24 interface) require longer transfer times.
6.	Once the APS transfer is completed, the HiPath 3000 Manager E reports that the “APS transfer was successful”. Once the set transfer time has been reached, the system resets and the new version is used for startup.
7.	Use the “APS stamp” to verify that the new APS has been activated. Use HiPath 3000 Manager E or Assistant T (menu item 29-1-2) to make the necessary query.

Notes on the APS transfer sequence

- If the transfer connection is interrupted (due to a line interruption, for example), the entire APS transfer must be manually restarted via HiPath 3000 Manager E. The complete APS transfer is performed again.
- Since the software is written to the MMC in compressed format during APS transfer, it must be unpacked after the transfer is complete (this takes about 5 minutes).
- After the APS transfer, the checksum is analyzed. If errors are found in the checksum, delete the transferred APS. You then have to repeat the complete APS transfer.
- Once the APS has been successfully transferred, the message "APS transfer was successful" appears. You can then finish the session.
- The system software uses a special system reset (none of the other resets initiate a changeover) to change over to the new APS.
  You cannot use the telephone while the system resets and boots up.

- After a successful changeover to the new APS, an entry in the error memory is also made and the old APS on the MMC is deactivated. This does not impede switching traffic. The deactivated area is now available for a new APS transfer. The positive or negative entry in the error memory is sent to the service center.

APS stamp: explanation using example

`HE600T.10.123`

Production number/software binder	
Feature package	Note: Service Maintenance Releases (SMR) are identified by production number and feature package.
System:	● up to and including V4.0: S = HiPath 3750/HiPath 3700 T = HiPath 3250/HiPath 3150 U = HiPath 3550/HiPath 3500/HiPath 3350/HiPath 3300 ● V5.0 or later: A = HiPath 5000 P = HiPath 3800 S = All HiPath 3000 systems, except for HiPath 3800
Version:	580 = HiPath 3000/5000 V4.0 600 = HiPath 3000/5000 V5.0
Software:	A = Manager/Assistant ... E = System
HiPath ...	

Software modifications for the correction of faults and the provision of a small number of new features are called software updates or service maintenance releases (SMR). A CDB conversion is not necessary.
Software upgrades are used for more extensive enhancements to the scope of services. An upgrade may also include modifications to hardware as well as error corrections. A software upgrade changes the name of the version, for example, from V1.0 to V2.0. A CDB conversion may be necessary.

12.2.3.2 APS Transfer for HiPath 3000 Systems With HiPath Software Manager

Definition

The HiPath Software Manager supports, among other things, updates of the system software (Upgrade Manager) of all HiPath 3000 systems in the same customer network. An update of the software of installed HG 1500 boards (HG 1500 V3.0 SMR-3 or later) can also be performed.

The following options are available under the menu item “Upgrade”:

- upgrade all HG 1500 boards and HiPath 3000 systems
- upgrade HG 1500 boards (HG 1500 V3.0 SMR-3 or later)
- upgrade all HiPath 3000 systems
  Note: The file format “*.fli” must be selected for APS transfer using HiPath Software Manager.

The software (APS and/or HG 1500) is updated in two steps. First, the new software is loaded to a system memory known as the "shadow area". This occurs in the background independently of the system status.

In the second step, the new software version must be made available, in other words, the switch from the current software version to the new software version must take place. The current software is replaced by the software in the shadow area and thus deleted. The changeover can either be started immediately once the software has been loaded or performed at a predefined time.

> ⚠ **Caution**
> It is important to make sure that the changeover time for a HG 1500 board does not coincide with the changeover time for the corresponding HiPath 3000, as this can render the HG 1500 board unfit for operation. The default setting of the HiPath Software Manager therefore incorporates a safety margin of 10 minutes between the changeovers.

Information about updating the system software and the HG 1500 software using HiPath Software Manager can be obtained from the help provided with this tool.

Note: If HiPath Software Manager is not available, the HG 1500 software update must be performed with HiPath 3000 Manager I (up to and including HG 1500 V2.0) or Web-based Management WBM (HG 1500 V3.0 or later).

For APS transfer using HiPath Software Manager, the HiPath 3000/5000 TFTP server must be installed on a server in the customer LAN. All HiPath 3000 systems must be able to access this HiPath 3000/5000 TFTP server over IP. Other TFTP servers cannot be used for HiPath Software Manager.

12.2.4 Upgrading HiPath 3000

For information on upgrade procedures, please see Section 9.3, “Upgrading HiPath 3000 to V5.0”.

12.2.5 Determining System Information and Installed Software Components (HiPath Inventory Manager)

Definition

HiPath Inventory Manager is a service for detecting the installed software components and system information in a HiPath 3000/5000 network. System information is only determined upon initial start-up of the service.

The relevant information can be displayed in table format by clicking one of the following buttons:

- Master Setup
  Information including version and installation date of the master setup.
- HiPath 3000
  Hardware and software information regarding the HiPath 3000 systems in the network and the installed HG 1500 boards.
- HiPath Applications
  Information regarding the following software components:
  - MS Windows components (MS Internet Explorer, DNS server, DHCP server)
  - Media Streaming
  - TAPI
  - CCMC, CCMS, CMD, CSP
  - Administration
  - HiPath 5000 Server
  - GetAccount
  - HiPath 3000 Manager E
  - Common Software
- Operating System
  Information regarding the current operating system.

All information can be updated at any time via the “Update data” button.

The system information is automatically determined when the HiPath Inventory Manager service is started for the first time. A cyclic update can be performed every ≥ 1 days. The system information can be queried manually at any time. This should always be done before an update/upgrade, for example.

Further details on how to determine the system information using HiPath Inventory Manager can be obtained from the help provided with this tool.

12.2.6 Backing Up System Components (Backup Manager)

Definition

The HiPath Software Manager allows the following system components and databases of a HiPath 3000/5000 network to be backed up:

- Full backup (= default setting)
  This option creates a data backup for all HiPath 3000 systems and HG 1500 boards in the HiPath 3000/5000 network as well as databases (Feature Server, SQL Server).
- HG 1500 backup
  This menu item displays all HG 1500 boards in the HiPath 3000/5000 network in an overview. It is possible to back up the data of one or all of the displayed HG 1500 board(s) (HG 1500 V3.0 SMR-3 or later).
- HiPath 3000 backup
  With this menu item, all HiPath 3000 systems in the HiPath 3000/5000 network are displayed in an overview. It is possible to back up the data of a specific system or of all displayed HiPath 3000 systems.
- Database backup
  With this menu item, all databases (Feature Server, SQL Server) are displayed in an overview. It is possible to back up the data of one or of all database(s).

Refer to the help provided with the HiPath Software Manager for information on backup with this tool.

Setting options

It is possible to specify individually when a backup is to take place and where the backed up data can be stored.

- Time of data backup
  The data backup can either be started manually immediately or performed at a predefined time. By default, a full backup is performed cyclically, with the data being saved daily at a specific time.
- Backup path
  The path for the directory in which the backup files are to be stored can be specified.
- Backup to a local drive
  There is no need to specify a special user account for this type of backup.
- Backup to a network drive
  A user account (user name, password) with write permission for the network drive must be specified for this type of backup.
  If the backup source (for example HiPath 5000) is located on a separate PC, this user account must have read permission for the shared drive.

The backup path and the type of backup are preset for the HiPath Software Manager during setup.

Restoring data

The HiPath Software Manager allows damaged databases to be restored with the database backup.

The other system components are restored using HiPath 3000 Manager E (for HiPath 3000) and HiPath 3000 Manager I (for HG 1500 up to and including V2.0) or Web-based management WBM (for HG 1500 V3.0 or later).

12.2.7 HiPath User Management (not yet released)

HiPath User Management will be implemented in Small Remote Site scenarios in HiPath 3000/5000 V5.0 and later. These are networks in which HiPath 4000 functions as a central system. HiPath 3000 systems are used in smaller branch locations (Small Remote Sites, SRS).

IP stations can be "relocated" from one branch (HiPath 3000) to another (HiPath 3000) or from the central office (HiPath 4000) to a branch (HiPath 3000) and vice versa via HiPath User Management.

Small Remote Site Concept

In normal mode, all IP workpoint clients (system clients) are registered with the central system HiPath 4000. In an emergency (failure of the central HiPath 4000 system or the CorNet IP network), the IP workpoint clients in the branch react and automatically register with their branch HiPath 3000 via the SRS concept. These workpoint clients are then available to users with all features of HiPath 3000.

The IP workpoint clients (system clients) reregister with the central HiPath 4000 system when normal mode is resumed.

The Small Remote Site concept requires that branch systems and the central system are connected via an IP network. It is not possible to integrate HiPath 5000 PCs with HiPath ComScendo Service. System clients (IP workpoint clients) such as optiPoint 410 (not optiPoint 410 entry), optiPoint 420 and optiClient 130 V5.0 are supported.

For further information on the Small Remote Site concept, refer to the HiPath 3000/5000 V5.0 Feature Description.

HiPath 3000 Element Manager

The link between HiPath User Management and the HiPath 3000 systems involved is the HiPath 3000 Element Manager. For the central HiPath 4000 system, access is accomplished via Element Manager in HiPath 4000 Manager.

Element Manager allows the central administration of a Small Remote Site scenario via HiPath User Management.

After installing HiPath 3000 Element Manager, configure the HiPath 3000 systems to be administered via HiPath User Management. You can do this via the HiPath 3000 Element Manager web-based configuration interface. You can add or remove individual systems in the node configuration menu. Once you have added a system (node), any information on its configured IP workpoint clients (system clients) is retrieved immediately via SNMP.

The basic configuration of HiPath 3000 for an SRS scenario is carried out via HiPath 3000 Manager E (Settings menu: Set up station (emergency mode)). User Management recognizes the configured system clients and identifies them internally as HiPath 3000 SRS telephones.

The next procedure depends on customer specifications:

- The IP workpoint clients in the Small Remote Sites (branches) should use the same call numbers in normal mode (registered with HiPath 4000) and in emergency mode (registered with HiPath 3000).

  In this case, the call numbers are assigned via HiPath User Management.
  When configuring the IP workpoint clients (system clients) via HiPath 3000 Manager E their call numbers should be deleted. Otherwise it is not possible to assign call numbers via HiPath User Management without taking further steps.

- The IP workpoint clients in the Small Remote Sites (branches) should use different call numbers in normal mode (registered with HiPath 4000) and in emergency mode (registered with HiPath 3000).

  In this case, the call numbers are assigned via HiPath 3000 Manager E when configuring the IP workpoint clients (system clients).
  An IP workpoint client configured in this way can then be assigned a HiPath 4000 call number for normal mode via HiPath User Management.

The following configuration data for an IP workpoint client is modified via HiPath User Management:

- Internal call number
- DID number
- Directory name
- CFSS destination
- Access groups

> Refer to the HiPath User Management service and administrator documentation for information on the installation and configuration procedures for HiPath 3000/5000 and HiPath 3000 Element Manager.

12.3 Guided Maintenance

12.3.1 Diagnosis Options

12.3.1.1 Recording HiPath 3000 Board Status

12.3.1.1.1 Central Control Boards

RUN LED

A RUN LED that displays the system’s operating capacity is located on the central control board.

Table 12-2 RUN LED - LED Status Meaning

RUN LED	Meaning
Off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

[1] The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

Options available?

You can call up the following options using the HiPath 3000 Manager E:

- CMA
- CMS
- LIM
- IMODN

- MPPI, UAM (only with HiPath 3550, HiPath 3350) or UAMR (only with HiPath 3500, HiPath 3300)
  The availability of one of these Announcement and Music Modules is displayed as "Option 5".
  The ALUM4 module cannot be displayed.

12.3.1.1.2 Power Supplies

Table 12-3 Power Supply Status Displays

Board	Status Display
HiPath 3800	
LUNA2	The LED displays the operating status (on or off).
HiPath 3750, HiPath 3700	
UPSM	The LED displays the operating status (on or off).
HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300	
PSUP	The LED displays the 5-V output voltage.
UPSC-D, UPSC-DR	• A green LED displays the 5-V output voltage. • A yellow LED displays the additional power of –48-V output voltage provided by an external power supply unit (EPSU2 or EPSU2R).

12.3.1.1.3 Peripheral Boards

Viewing peripheral board status

You can use HiPath 3000 Manager E or Assistant T to view the status of all peripheral boards. Display is limited to the following statuses per board:

- Board not inserted
- Board defective (not loaded)
- Board disabled
- Board enabled (active)
- Board busy (at least one station or line from this board is disconnected, is being called, or is busy).

For ISDN boards, the status of the reference clock is displayed:

- No reference clock
- Reference clock for clock generator is created.

When viewing the board status using the HiPath 3000 Manager E, all peripheral boards integrated into the system are presented in a table. The status display is updated every 3 seconds.

With Assistant T, you can only view the status of one board at a time. You can also update the status display by pressing a key.

You cannot perform additional activities with the HiPath 3000 Manager E and Assistant T while viewing the status of a board.

Table 12-4 HiPath 3000 Manager E - Example of Status Display of Peripheral Boards

Slot	Board	not inserted	Defective	Blocked	Free	Res.	Clock source
1	STLS2			X		X	X
2	SLU8		X				
3	SLA4			X	X		
4	TLA8		X				
5							
6							
7	TS2			X	X		
8	16SLA	X					
9							
10	SLMO24				X		

HiPath 3750 and HiPath 3700: LEDs on peripheral boards

All peripheral boards are equipped with LEDs for displaying the status of a board or port. Information on the meaning of the individual LED statuses can be found in the descriptions of individual boards in Chapter 3.

Locking out and releasing boards and ports

Using the HiPath 3000 Manager E and Assistant T, you can lock out a complete station or trunk module. The lockout prevents renewed seizure after the current connection has finished. Release or lockout settings are also retained after a reset.

The first SLMO/SLU board can be blocked. This action does not block the first two ports. You can block specific ports with the "Block selection" option.

Ports of an IVM or HG 1500 board cannot be locked.

When attempting to lock out the last active trunk, you are subsequently notified that remote service through the service center is no longer possible.

12.3.1.2 Recording HiPath 3000 Trunk Status

HiPath 3000 records the current status of each individual trunk in a table. If the status changes, the new status along with the time stamp is entered. You can use HiPath 3000 Manager E to view the trunk status, in which case the following information is provided.

Data	Contents
Date	Date of the event (as stored in system)
Time	Time of the event (as stored in system)
Trunk number	Number of the trunk
Slot/Port	Slot and port number
Status	● Trunk status: – Inactive – Incoming call – Outgoing call – Trunk-to-trunk connection – Trunk disabled (using lockout switch or HiPath 3000 Manager E) – Trunk failure ● Number of the connected station

12.3.1.3 Recording Station Status

HiPath 3000 records the current status of each individual station in a table. You can use HiPath 3000 Manager E to view the station status, in which case the following information is provided.

Data	**Contents**
Station name	Name of the selected station
Slot, port	Example: 7-1
Telephone model	Example: optiPoint 500 advance
Telephone status	Active or inactive
DID number	External number of the selected station
Language	Menu language of selected station
Connection status	● Inactive: The telephone is idle. ● Busy: The telephone is off the hook, but not yet dialed. ● Waiting: The telephone call is in the queue. ● Connected: The telephone is connected to a second telephone with a trunk or a hunt group member. ● Holding: The telephone is on hold. ● Error: The connection cannot be established due to an error (for example, invalid telephone number). ● Call: The telephone is called.
Connected to	The number of the connected station or trunk
Forwarding status	● Off: No call forwarding activated. ● Internal: Call forwarding activated only for internal calls. ● External: Call forwarding activated only for external calls. ● All: Call forwarding activated for all calls.
Destination	Number of call forwarding destination

Data	Contents
Activated features	Status of activated features (on or off): ● Do Not Disturb ● Call forwarding (device status) ● Answer text ● Room monitor ● Lock Code ● Suppress calling ID ● Call connection ● Disable incoming ringing ● Out of Hunt group/Group ringing ● Call waiting tone ● Direct Answering ● Call waiting terminating ● Ring transfer (only for MULAP) ● Call forwarding MULAP (only for MULAP)
Stations included	List of the stations included

12.3.1.4 Recording the Status of the HiPath 3000 V.24 Interfaces

You can use HiPath 3000 Manager E to view the current status of the V.24 interfaces, in which case the following information is provided.

- Status of the trunks (1 = active trunk, 0 = inactive trunk)
  The individual trunks are assigned as follows:
  DTR = HiPath 3000
  DSR = Telephone
  RTS = HiPath 3000
  CTS = Telephone

  This means, for example, that incorrectly connected or damaged cables can be determined (for more information on this, refer to the HiPath 3000 Manager E Help).
- V.24 Monitoring
  The number of sent/received bytes within a selected time period can be recorded and then displayed/saved using a text editor (default = MS WordPad®).

The failure and restart of a V.24 interface generates an entry in the eventlog and releases a remote error signal (V.24 failure = “Check printer” error message, V.24 restart = Withdrawal of error message).

12.3.1.5 Trace Options for HiPath 3000

> Special user rights are required for activating the Trace setting in the Maintenance menu, that are exclusively reserved by the user group Development.

Tracing ISDN activities

This feature allows the user to trace ISDN telephones (subscriber ports) and ISDN trunks (trunk ports) in real time. ISDN activities are routed to HiPath 3000 Manager E and saved in a trace file. Only the ISDN sequences are displayed on the monitor, not the content of the ISDN messages.

The feature is activated in HiPath 3000 Manager E by selecting the "Call Monitoring" tab under Maintenance. The Start button starts Call Monitoring, whereupon the data of all available ports in the system is read out.

If the trace session is over, you can start the **ISDN Message Decoder** (ISDN Tracer) and use it to convert the trace file into a readable format (English only). You can also read out the trace data using remote service.

The ISDN Message Decoder is a 32-bit application which converts ISDN layer-3 messages and information elements into a readable format. Since you cannot find out from the trace file whether it deals with an information element from a Euro ISDN or a QSig configuration, you have to select the protocol. You may select the following settings from the main menu:

- Raw (default setting)
- Euro ISDN
- QSig V1
- CorNet NQ

With the “Raw” setting, the Hex values are only decoded, not interpreted. With the other two settings, the Hex values are decoded and interpreted for each feature (CC, AOC, etc.).

Tracing call-specific activities

You can trace all activities that were initiated by a call for telephones, trunks, etc. These include consultation calls, conference calls, and hunt groups, for example.

12.3.1.6 HiPath Manager PCM Trace Monitor for HiPath 5000

12.3.1.6.1 HiPath Manager PCM Trace Monitor Applications

Communication between the different HiPath 5000 applications is organized using various buffer tables and messages. You can monitor the individual entries in the different buffer tables, exchanged immediate messages, program and communication messages for the relevant component in a separate trace window, in other words, a separate window is opened for each component (application).

The trace windows can be viewed using the Trace Monitor and swapped out for further processing.

> This documentation does not cover interpretation of the trace window contents by the Trace Monitor. Trace files are used for problem analysis and are interpreted by Service Support during servicing.
> The description below can be used to determine the work steps required for Trace Monitor navigation and control and for swapping out the trace contents to a file.

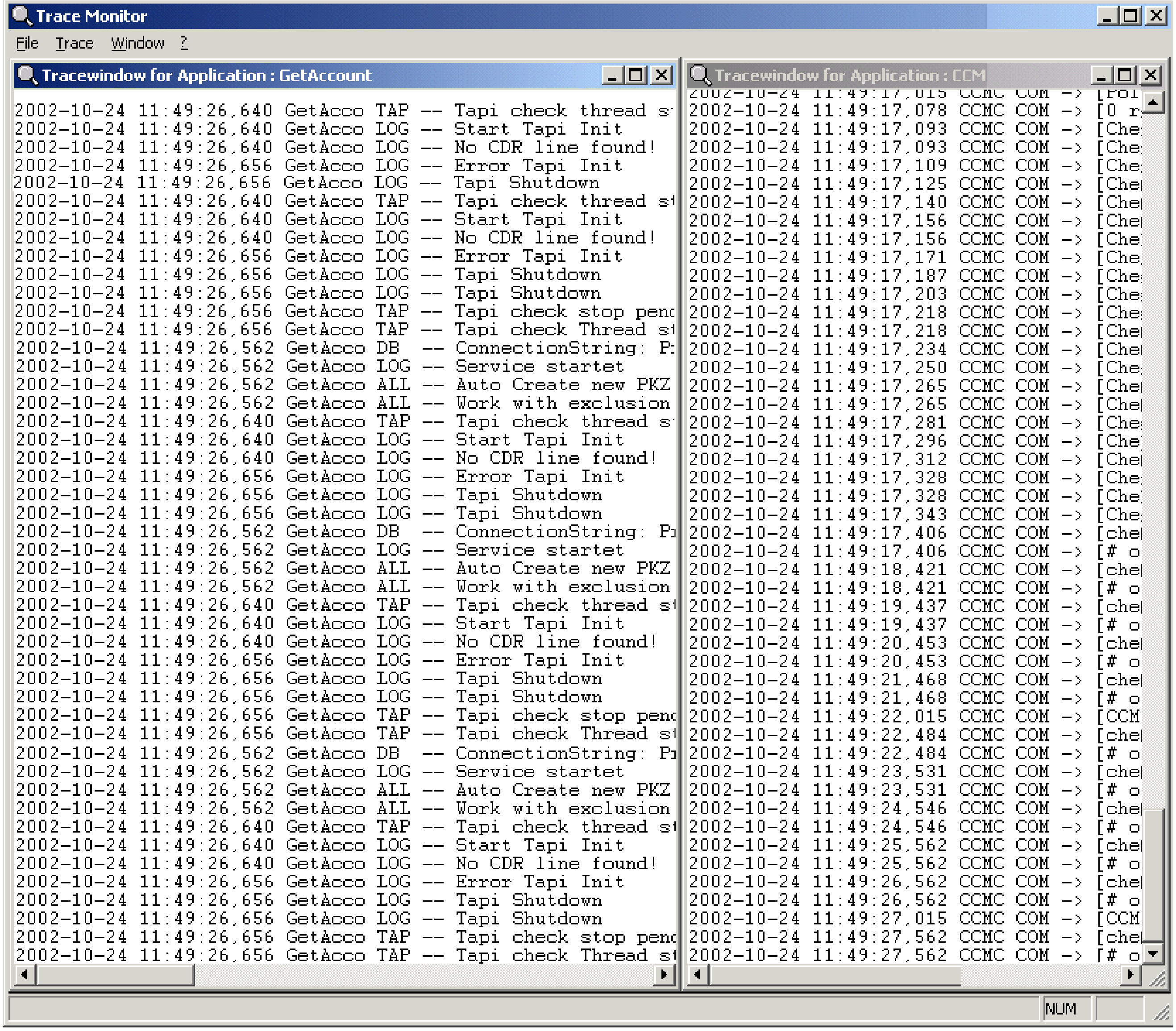
Trace messages can be displayed for the following HiPath 5000 applications:

- Feature Server
  Two trace files are available:
  - `\winnt\system32\carlogfile.txt`
    provides details on which HG 1500 boards have logged on to the network and when.
  - `\winnt\system32\rgtracefile.txt`
    provides details on when the individual HG 1500 boards were assigned a station number.
- Presence Manager
  Two trace files are available:
  - `\winnt\system32\dssdiagnosefile.txt`
  - `\winnt\system32\dsslogfile.txt`
- HiPath Manager PCM Administration
  Administration of the configuration parameters for component control by the user, for general parameters, for call charge evaluation and analysis.
- HiPath Manager PCM
  Configuration of call handling and call forwarding using definable profiles.
- HiPath GetAccount
  Internal component that is responsible for evaluating and saving call charges and for immediate printing.

12.3.1.6.2 Starting and Exiting the Trace Monitor

The `HiPath Manager PCM` program group was created when installing the HiPath Manager PCM server. Administration and the trace monitor were integrated here.

To start the Trace Monitor, select `Start - Programs - HiPath - HiPath Manager PCM Trace Monitor for HiPath Applications`.


Trace Monitor
File
Trace
Window
?
Tracewindow for Application : GetAccount
Tracewindow for Application : CCM
NUM

```
2002-10-24 11:49:26,640 GetAcco TAP -- Tapi check thread s
2002-10-24 11:49:26,640 GetAcco LOG -- Start Tapi Init
2002-10-24 11:49:26,640 GetAcco LOG -- No CDR line found!
2002-10-24 11:49:26,656 GetAcco LOG -- Error Tapi Init
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,640 GetAcco TAP -- Tapi check thread st
2002-10-24 11:49:26,640 GetAcco LOG -- Start Tapi Init
2002-10-24 11:49:26,640 GetAcco LOG -- No CDR line found!
2002-10-24 11:49:26,656 GetAcco LOG -- Error Tapi Init
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,656 GetAcco TAP -- Tapi check stop penc
2002-10-24 11:49:26,656 GetAcco TAP -- Tapi check Thread st
2002-10-24 11:49:26,562 GetAcco DB  -- ConnectionString: P:
2002-10-24 11:49:26,562 GetAcco LOG -- Service startet
2002-10-24 11:49:26,562 GetAcco ALL -- Auto Create new PKZ
2002-10-24 11:49:26,562 GetAcco ALL -- Work with exclusion
2002-10-24 11:49:26,640 GetAcco TAP -- Tapi check thread s
2002-10-24 11:49:26,640 GetAcco LOG -- Start Tapi Init
2002-10-24 11:49:26,640 GetAcco LOG -- No CDR line found!
2002-10-24 11:49:26,656 GetAcco LOG -- Error Tapi Init
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,562 GetAcco DB  -- ConnectionString: P
2002-10-24 11:49:26,562 GetAcco LOG -- Service startet
2002-10-24 11:49:26,562 GetAcco ALL -- Auto Create new PKZ
2002-10-24 11:49:26,562 GetAcco ALL -- Work with exclusion
2002-10-24 11:49:26,640 GetAcco TAP -- Tapi check thread st
2002-10-24 11:49:26,640 GetAcco LOG -- Start Tapi Init
2002-10-24 11:49:26,640 GetAcco LOG -- No CDR line found!
2002-10-24 11:49:26,656 GetAcco LOG -- Error Tapi Init
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,656 GetAcco TAP -- Tapi check stop penc
2002-10-24 11:49:26,656 GetAcco TAP -- Tapi check Thread st
2002-10-24 11:49:26,562 GetAcco DB  -- ConnectionString: P
2002-10-24 11:49:26,562 GetAcco LOG -- Service startet
2002-10-24 11:49:26,562 GetAcco ALL -- Auto Create new PKZ
2002-10-24 11:49:26,562 GetAcco ALL -- Work with exclusion
2002-10-24 11:49:26,640 GetAcco TAP -- Tapi check thread st
2002-10-24 11:49:26,640 GetAcco LOG -- Start Tapi Init
2002-10-24 11:49:26,640 GetAcco LOG -- No CDR line found!
2002-10-24 11:49:26,656 GetAcco LOG -- Error Tapi Init
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,656 GetAcco LOG -- Tapi Shutdown
2002-10-24 11:49:26,656 GetAcco TAP -- Tapi check stop penc
2002-10-24 11:49:26,656 GetAcco TAP -- Tapi check Thread st
```

```
2002-10-24 11:49:17,015 CCMC COM -> [Poi
2002-10-24 11:49:17,078 CCMC COM -> [0 r
2002-10-24 11:49:17,093 CCMC COM -> [Che
2002-10-24 11:49:17,093 CCMC COM -> [Che
2002-10-24 11:49:17,109 CCMC COM -> [Che
2002-10-24 11:49:17,125 CCMC COM -> [Che
2002-10-24 11:49:17,140 CCMC COM -> [Che
2002-10-24 11:49:17,156 CCMC COM -> [Che
2002-10-24 11:49:17,156 CCMC COM -> [Che
2002-10-24 11:49:17,171 CCMC COM -> [Che
2002-10-24 11:49:17,187 CCMC COM -> [Che
2002-10-24 11:49:17,203 CCMC COM -> [Che
2002-10-24 11:49:17,218 CCMC COM -> [Che
2002-10-24 11:49:17,218 CCMC COM -> [Che
2002-10-24 11:49:17,234 CCMC COM -> [Che
2002-10-24 11:49:17,250 CCMC COM -> [Che
2002-10-24 11:49:17,265 CCMC COM -> [Che
2002-10-24 11:49:17,265 CCMC COM -> [Che
2002-10-24 11:49:17,281 CCMC COM -> [Che
2002-10-24 11:49:17,296 CCMC COM -> [Che
2002-10-24 11:49:17,312 CCMC COM -> [Che
2002-10-24 11:49:17,328 CCMC COM -> [Che
2002-10-24 11:49:17,328 CCMC COM -> [Che
2002-10-24 11:49:17,343 CCMC COM -> [Che
2002-10-24 11:49:17,406 CCMC COM -> [che
2002-10-24 11:49:17,406 CCMC COM -> [# o
2002-10-24 11:49:18,421 CCMC COM -> [che
2002-10-24 11:49:18,421 CCMC COM -> [# o
2002-10-24 11:49:19,437 CCMC COM -> [che
2002-10-24 11:49:19,437 CCMC COM -> [# o
2002-10-24 11:49:20,453 CCMC COM -> [che
2002-10-24 11:49:20,453 CCMC COM -> [# o
2002-10-24 11:49:21,468 CCMC COM -> [che
2002-10-24 11:49:21,468 CCMC COM -> [# o
2002-10-24 11:49:22,015 CCMC COM -> [CCM
2002-10-24 11:49:22,484 CCMC COM -> [che
2002-10-24 11:49:22,484 CCMC COM -> [# o
2002-10-24 11:49:23,531 CCMC COM -> [che
2002-10-24 11:49:23,531 CCMC COM -> [# o
2002-10-24 11:49:24,546 CCMC COM -> [che
2002-10-24 11:49:24,546 CCMC COM -> [# o
2002-10-24 11:49:25,562 CCMC COM -> [che
2002-10-24 11:49:25,562 CCMC COM -> [# o
2002-10-24 11:49:26,562 CCMC COM -> [che
2002-10-24 11:49:26,562 CCMC COM -> [# o
2002-10-24 11:49:27,015 CCMC COM -> [CCM
2002-10-24 11:49:27,562 CCMC COM -> [che
2002-10-24 11:49:27,562 CCMC COM -> [# o
```

Figure 12-1 Trace Monitor

The Trace Monitor can be closed with **Exit** in the File menu, with the key combination [F8] + [F4] or with the Trace Monitor system menu.

12.3.1.6.3 The Screen Layout of the Trace Monitor

When you start the Trace Monitor, an application window with the following layout appears:

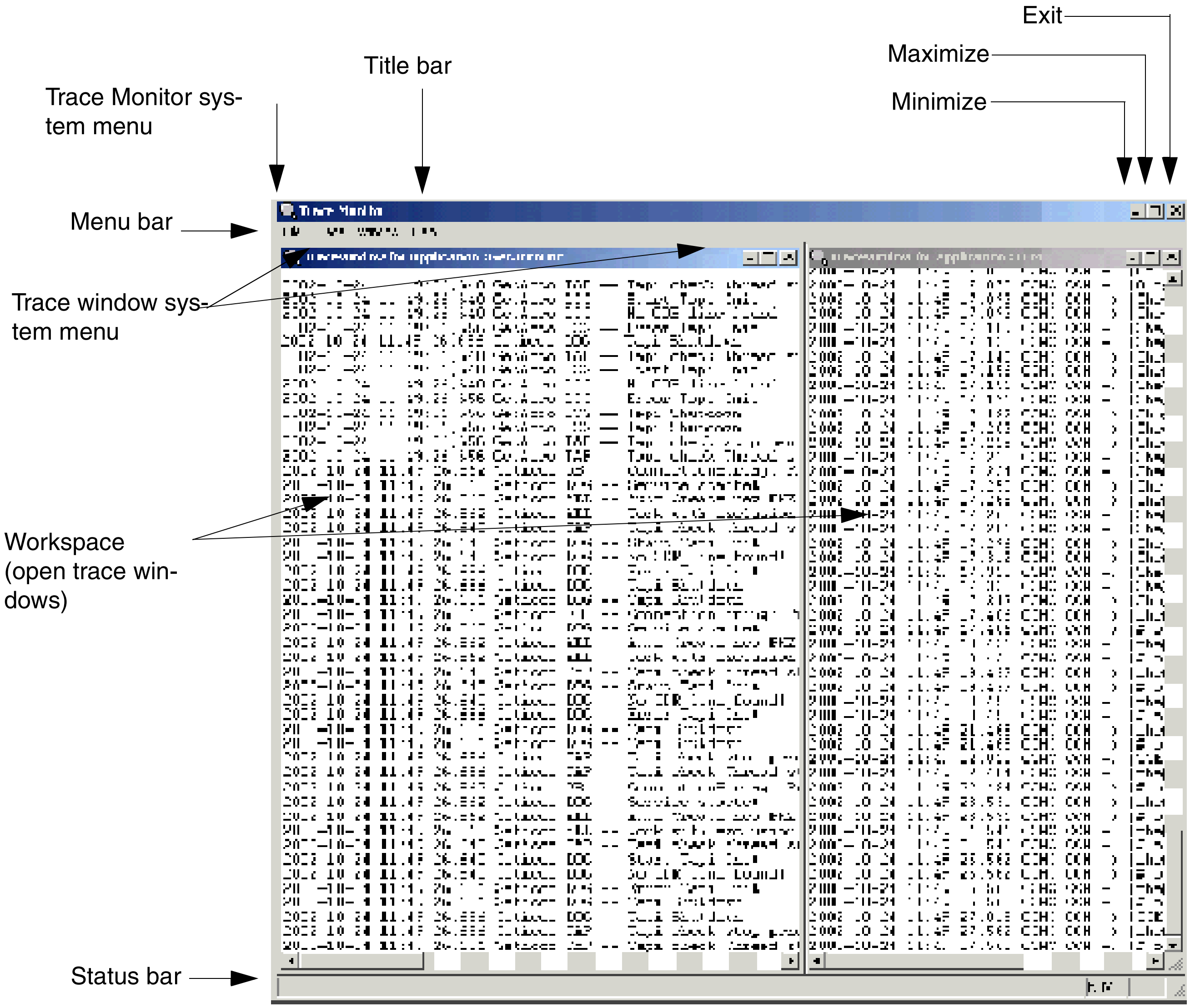

Exit
Maximize
Title bar
Minimize
Trace Monitor system menu
Menu bar
Trace window system menu
Workspace (open trace windows)
Status bar

Figure 12-2 The Screen Layout of the Trace Monitor

The Trace Monitor menu bar lists the available menus/menu items.

Table 12-5 Trace Monitor Menu Functions

Menu name	Menu item	Function
File	Print Setup	Setup of the printer for the output of trace messages to the printer.
	Exit	Closes the Trace Monitor
Trace	Use Hex font	The output of special trace messages with non-displaying characters is displayed in a hex font (option active) or in ANSI font (option not active). Default messages are always displayed in ANSI format.
	Colored Text	Toggles between color (option active) and black-and-white display (option not active) for trace messages.
	Add Date/Timestamp	Inserts a timestamp in each new trace message when the option is active.
	Show Window for new Application	If this option is active, one of the applications that writes trace messages is immediately displayed in a separate trace window when it is activated. If the option is not active, trace windows for active applications can be opened or closed manually by selecting the entry Trace - <Name of Application>.
Window	Cascade	Displays the trace windows in a cascade.
	Tile Vertically	Displays the trace windows side by side.
	Tile Horizontally	Displays the trace windows one above the other.
	Arrange Icons	Arranges the trace windows reduced to an icon.
?	About...	Activates Trace Monitor program information.

12.3.1.6.4 General Functions

Opening and closing a trace window

The following options are available for opening and closing trace windows:

- **Automatic**
  Select the option Show New Logon Immediately (checkmark visible next to menu item) in the Trace menu to activate the automatic opening/closure of trace windows when the relevant application is started/exited. To disable this option, select the entry again. The checkmark is removed.
- **Manual**
  If this option is not set, you can open and close the trace windows for the active applications manually. The Trace menu should be activated for this purpose. The first entries displayed are the available trace windows. Open trace windows are checkmarked.
  - To open a closed window you must activate the entry. The checkmark is set and the trace window is opened.
  - To close an open window you must reactivate the entry. The checkmark disappears and the trace window is closed.

Print trace window content

You also have an option that allows you to output the current status of a trace window to the configured Trace Monitor printer for documentation purposes. For this, select the **Print Messages** entry via the System menu or, alternatively, the Context menu (right click in the Trace window) of the relevant Trace window. The current contents of the trace window are then sent to the configured printer.

Deleting the contents of the trace window

To delete the contents of a trace window, select the **Delete Messages** entry via the system menu or, alternatively, the Context menu (right click in the Trace window) of the relevant Trace window. The contents are deleted and the window is empty.

Freezing the contents of a trace window

To stop messages scrolling, you can freeze the current status of the trace window display. For this, select the **Stop Window Scrolling** entry via the system menu or, alternatively, the Context menu (right-click in the Trace window) of the relevant Trace window. The contents of the trace window are frozen. New trace messages are loaded to the buffer, but are no longer displayed.

To disable this option, select the menu item **Stop Window Scrolling** again. The option is removed and recent messages are displayed.

Arranging trace windows

The active Trace Monitor trace windows can be arranged as follows:

- Cascade
  Using the key combination ⇧ + F5 or via the **Cascade** entry in the menu window.
- Tile Horizontally
  Using the key combination ⇧ + F6 or via the **Tile Horizontally** entry in the menu window.
- Tile Vertically
  Using the key combination ⇧ + F4 or via the **Tile Vertically** entry in the menu window.

If the Trace windows are minimized as symbols, these can be arranged using the status bar. For this, select the **Arrange Icons** entry in the menu window.

12.3.1.6.5 Exporting Trace Windows

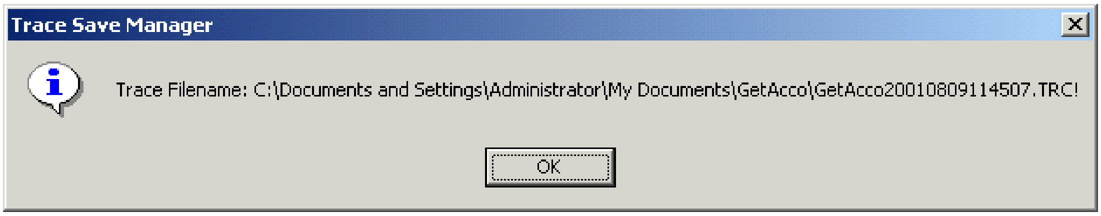
Each trace window has a capacity of 1,000 (for the Server PC under Windows 95/98) or 5,000 entries (for the Server PC under Windows NT or Windows 2000). When this capacity is reached, the oldest entry is deleted from the trace window for each new entry.

To document a current situation from a trace window, you can save the current status of a trace window to a swap file.

Procedure

1. The **Write Messages to File** entry should be selected via the system menu or, alternatively, the context menu (right-click in the Trace window) of the relevant Trace window.

   A message box containing the path and file name of the swap file for the trace window appears:



Trace Filename: C:\Documents and Settings\Administrator\My Documents\GetAcco\GetAcco20010809114507.TRC!

2. Confirm the message with **OK**.

The default **destination directory** for swap files is the Windows 2000 shell user directory:

```
C:\Documents and Settings
    \[Windows User]
      \My Documents
        \[Application ID]
          \[Trace File Name]
```

The following naming conventions apply to swap files:

```
<Application ID><Time>.trc
```

The time is stored in YYYYMMDDhhmm format.

Example of a file name for a swapped-out trace file

Windows User: Meier
Application: GetAccount
Exported on: 06.09.2004
at: 16:57:

```
C:\Documents and Settings
    \Meier
      \My Documents
        \WACLIENT          \WACLIENT200409061657.trc
```

12.3.1.7 Eventlog for HiPath 3000

HiPath 3000 features an eventlog where accrued errors are classified according to error class and error number with the date/time of the original error. You can use HiPath 3000 Manager E to read out the eventlog.

Section 12.3.2 contains information on the possible entries.

12.3.1.8 Testing Telephones

After startup and country adaptation, you can activate the terminal test on any optiPoint 500 or optiset E telephone using a code or the service menu. This test checks the display (your number is displayed), LEDs, and ring tones. The tests ends automatically after a period of time. The test allows you to perform a visual and acoustic check of the components to ensure that they are functioning properly.

Test procedure on the system telephone

Table 12-6 Terminal Test

Step	Entry	Description
1.	*940	Code for terminal test
2.	–	For approximately five seconds, all LEDs blink quickly (except for the Service menu LED), all display pixels are activated, and you can hear a tone.

> ℹ If the test does not react as described, an additional power supply (plug-in power supply unit) for the relevant system telephone may be necessary.

If the time and date do not appear in the display after startup, either the system telephone or the cable path is defective. Either exchange the system telephone or check the cable path.

12.3.1.9 Event Viewer for HiPath 5000 (Eventlog)

Introduction

The Event Viewer (Eventlog) is one of the tools supplied with NT-based operating systems (Microsoft Windows NT, Microsoft Windows 2000, Microsoft Windows XP, etc.). The Event Viewer administers logs that record information on programs, security, and system events on the computer. You can use it to display and administer eventlogs, to gather information on hardware and software problems, and to monitor security events.

You can use this standard tool to obtain status information for the HiPath 5000 server and any application server present.

All events associated with the server(s) and its (their) applications are saved. The events provide a quick and, above all, time-specific overview of all relevant actions (status, information, warning, error, etc.).

The tool itself handles the event entries. You can specify the length of the event file, the validity of events in days, the reaction when the maximum size has been reached, and the display filter, for example.

You can save the resulting event file (log file) under any name.

Starting the Event Viewer

Start the Event Viewer from the Windows Start menu: `Start/Programs/Administrative Tools/Event Viewer`

The Event Viewer associated with other application servers present can be opened via the HiPath 5000 server. To do this, select the relevant server in the network browser under `Operation/Connect to another computer/Other computer`.

Configuring the Event Viewer

The Event Viewer has at least three areas:

- System log: information on all operating system components
- Security log: information on changes to the security system and possible system violations
- Application log: application events

You can configure these areas independently of one another by marking the area and selecting `Operation/Properties`:

- The maximum log size (in KB) and the reaction if this value is exceeded are defined under "General". 1.44 MB (= capacity of a floppy disk) is the recommended log size. "Overwrite events where necessary" is the recommended setting.
- You can select an event source under "Filter" for example, to display only the entries for the HiPath 5000 server. You can further restrict the output under Category and Event ID.

Evaluating events

Double-click an entry in an Event Viewer area to obtain more precise information on an event. Use the two arrow buttons to spring from one event to the next.

The HiPath 5000 Server entries in Table 12-8 are currently supported.

Saving the event file (log file)

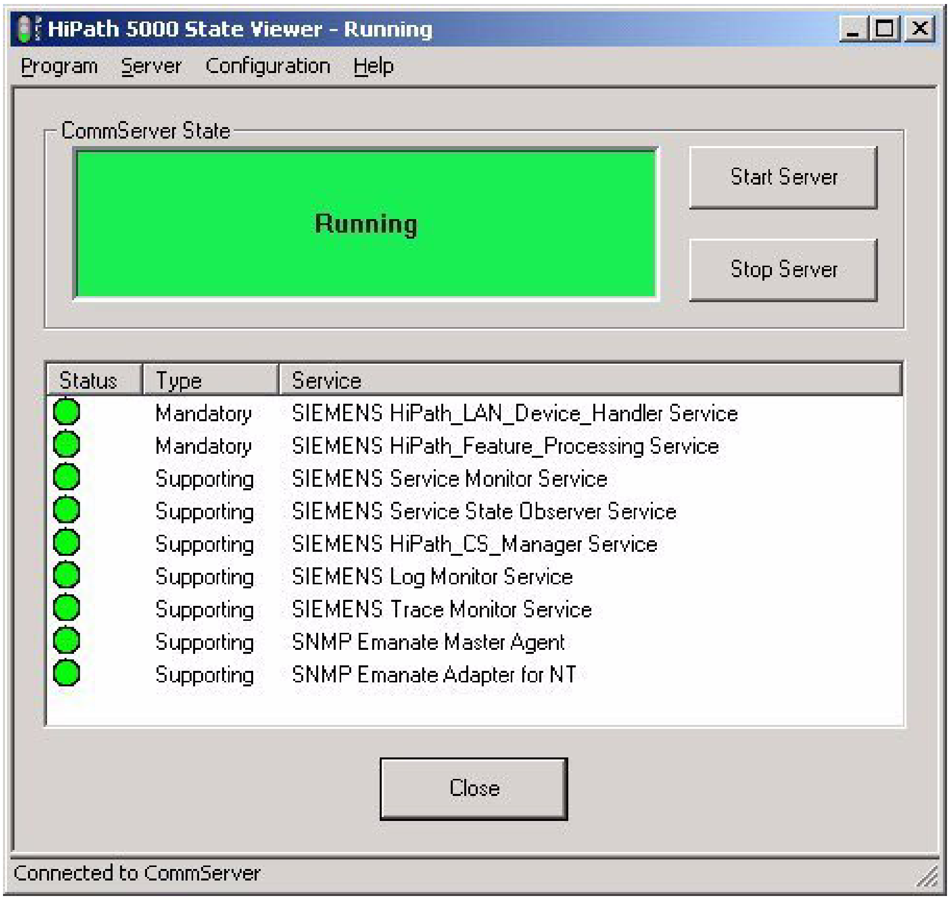
If problems occur within the customer network, you can save an Event Viewer area as an event log (log file) and then forward this file to the relevant Service Support personnel for further diagnosis.

Always save an eventlog (log file) in evt file format (file extension `*.evt`). The Event Viewer can only read and configure the file if it is in this format.

12.3.1.10 HiPath 5000State Viewer

The current status of the HiPath ComScendo service and all associated services can be checked via the State Viewer.

This can be invoked via `Start/Program Files/HiPath/HiPath 5000 State Viewer`.



Status	Type	Service
●	Mandatory	SIEMENS HiPath_LAN_Device_Handler Service
●	Mandatory	SIEMENS HiPath_Feature_Processing Service
●	Supporting	SIEMENS Service Monitor Service
●	Supporting	SIEMENS Service State Observer Service
●	Supporting	SIEMENS HiPath_CS_Manager Service
●	Supporting	SIEMENS Log Monitor Service
●	Supporting	SIEMENS Trace Monitor Service
●	Supporting	SNMP Emanate Master Agent
●	Supporting	SNMP Emanate Adapter for NT

Connected to CommServer

Figure 12-3 HiPath 5000 State Viewer

The example in Figure 12-3 illustrates the correct operation of a HiPath ComScendo service. For the server itself ("= Running") and all services, the "status indicators are green".

Menu bar

- Program – Exit: Closes the HiPath 5000 State Viewer.
- Server
  - Start: Starts the HiPath 5000 server.
  - Stop: Stops the HiPath 5000 server.
- Configuration

  - CPU allocation: In the case of a PC with a multi-processor system or HT processor, defines whether the operating system may distribute the threads of the Feature Processing (FP) and LAN Device Handler (LDH) services may be distributed over different processors.
  - Network card: In the case of a PC with more than one network card, defines which card is used for HiPath 5000 (may only be changed if the HiPath 5000 server becomes congested).
- About...
  - Version information: Shows the version of the installed modules (`.dll`, `.exe`).
  - About HiPath 5000 State Viewer...: Shows the current APS stamp and code number.

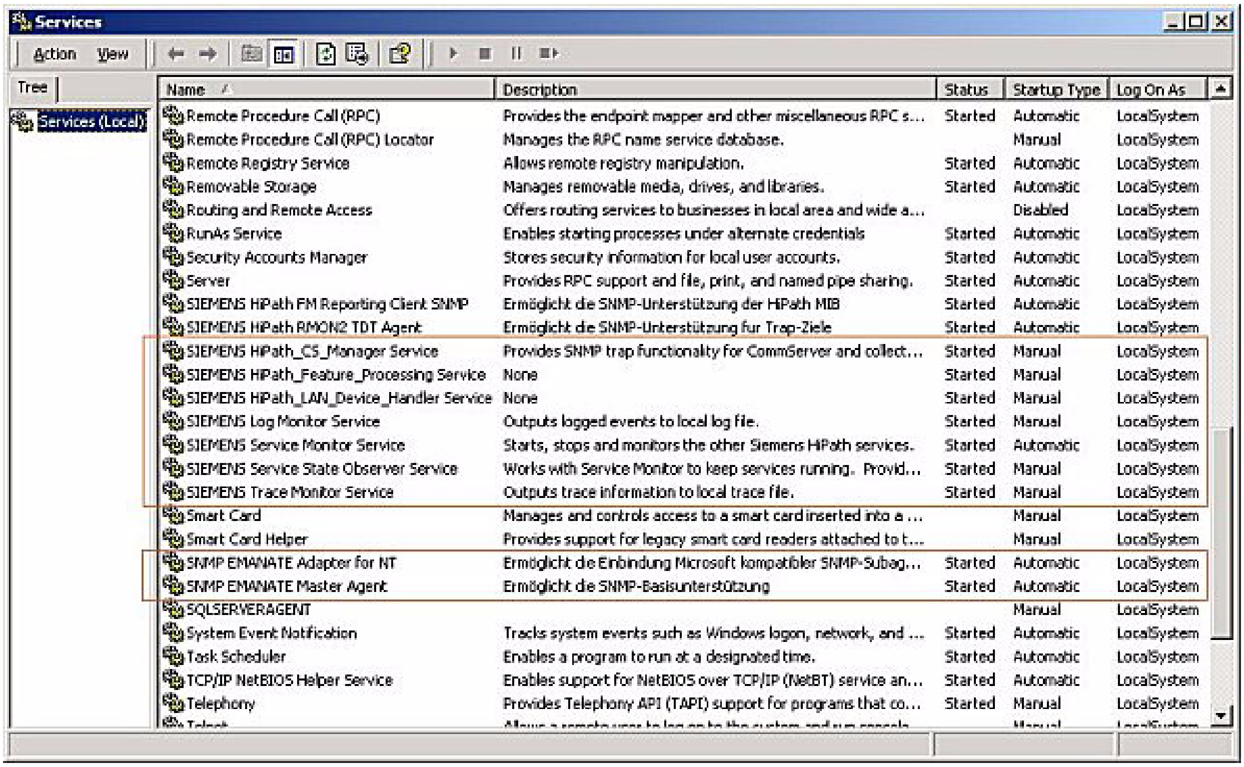
Procedure in the event of a fault

Administrator rights are required for the following measures.

In the event of a fault, in other words if one or more “status indicators are red”, proceed as follows:

1. Check the status of the services
   Select `Settings - Control Panel - Administrative Tools - Computer Management`.

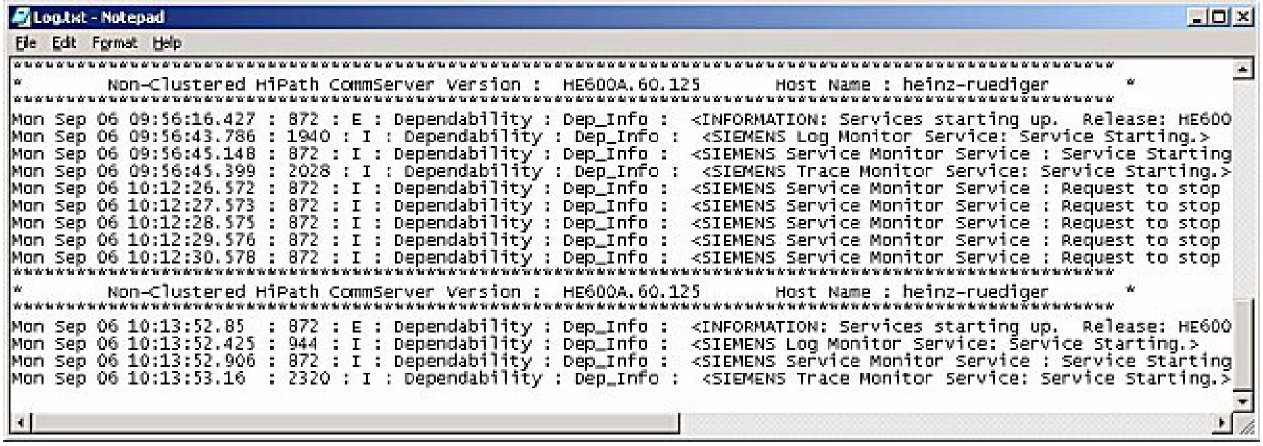
   All services must be started here (as shown in Figure 12-4, for example). If this is not the case, invoke log.txt.



Name	Description	Status	Startup Type	Log On As
Remote Procedure Call (RPC)	Provides the endpoint mapper and other miscellaneous RPC s...	Started	Automatic	LocalSystem
Remote Procedure Call (RPC) Locator	Manages the RPC name service database.		Manual	LocalSystem
Remote Registry Service	Allows remote registry manipulation.	Started	Automatic	LocalSystem
Removable Storage	Manages removable media, drives, and libraries.	Started	Automatic	LocalSystem
Routing and Remote Access	Offers routing services to businesses in local area and wide a...		Disabled	LocalSystem
RunAs Service	Enables starting processes under alternate credentials	Started	Automatic	LocalSystem
Security Accounts Manager	Stores security information for local user accounts.	Started	Automatic	LocalSystem
Server	Provides RPC support and file, print, and named pipe sharing.	Started	Automatic	LocalSystem
SIEMENS HiPath FM Reporting Client SNMP	Ermöglicht die SNMP-Unterstützung der HiPath MIB	Started	Automatic	LocalSystem
SIEMENS HiPath RMON2 TDT Agent	Ermöglicht die SNMP-Unterstützung fur Trap-Ziele	Started	Automatic	LocalSystem
SIEMENS HiPath_CS_Manager Service	Provides SNMP trap functionality for CommServer and collect...	Started	Manual	LocalSystem
SIEMENS HiPath_Feature_Processing Service	None	Started	Manual	LocalSystem
SIEMENS HiPath_LAN_Device_Handler Service	None	Started	Manual	LocalSystem
SIEMENS Log Monitor Service	Outputs logged events to local log file.	Started	Manual	LocalSystem
SIEMENS Service Monitor Service	Starts, stops and monitors the other Siemens HiPath services.	Started	Automatic	LocalSystem
SIEMENS Service State Observer Service	Works with Service Monitor to keep services running. Provid...	Started	Manual	LocalSystem
SIEMENS Trace Monitor Service	Outputs trace information to local trace file.	Started	Manual	LocalSystem
Smart Card	Manages and controls access to a smart card inserted into a ...		Manual	LocalSystem
Smart Card Helper	Provides support for legacy smart card readers attached to t...		Manual	LocalSystem
SNMP EMANATE Adapter for NT	Ermöglicht die Einbindung Microsoft kompatibler SNMP-Subag...	Started	Automatic	LocalSystem
SNMP EMANATE Master Agent	Ermöglicht die SNMP-Basisunterstützung	Started	Automatic	LocalSystem
SQLSERVERAGENT			Manual	LocalSystem
System Event Notification	Tracks system events such as Windows logon, network, and ...	Started	Automatic	LocalSystem
Task Scheduler	Enables a program to run at a designated time.	Started	Automatic	LocalSystem
TCP/IP NetBIOS Helper Service	Enables support for NetBIOS over TCP/IP (NetBT) service an...	Started	Automatic	LocalSystem
Telephony	Provides Telephony API (TAPI) support for programs that co...	Started	Manual	LocalSystem

Figure 12-4 HiPath 5000 Services

2. Open `log.txt` file
   The `log.txt` file contains detailed information about the services. You can open this file via `<Installation Directory>/PCSData/Debug`.



```
*******************************************************************************************
*        Non-Clustered HiPath CommServer Version :  HE600A.60.125       Host Name : heinz-ruediger       *
*******************************************************************************************
Mon Sep 06 09:56:16.427 : 872 : E : Dependability : Dep_Info :  <INFORMATION: Services starting up.  Release: HE600
Mon Sep 06 09:56:43.786 : 1940 : I : Dependability : Dep_Info :  <SIEMENS Log Monitor Service: Service Starting.>
Mon Sep 06 09:56:45.148 : 872 : I : Dependability : Dep_Info :  <SIEMENS Service Monitor Service : Service Starting
Mon Sep 06 09:56:45.399 : 2028 : I : Dependability : Dep_Info :  <SIEMENS Trace Monitor Service: Service Starting.>
Mon Sep 06 10:12:26.572 : 872 : I : Dependability : Dep_Info :  <SIEMENS Service Monitor Service : Request to stop
Mon Sep 06 10:12:27.573 : 872 : I : Dependability : Dep_Info :  <SIEMENS Service Monitor Service : Request to stop
Mon Sep 06 10:12:28.575 : 872 : I : Dependability : Dep_Info :  <SIEMENS Service Monitor Service : Request to stop
Mon Sep 06 10:12:29.576 : 872 : I : Dependability : Dep_Info :  <SIEMENS Service Monitor Service : Request to stop
Mon Sep 06 10:12:30.578 : 872 : I : Dependability : Dep_Info :  <SIEMENS Service Monitor Service : Request to stop
*******************************************************************************************
*        Non-Clustered HiPath CommServer Version :  HE600A.60.125       Host Name : heinz-ruediger       *
*******************************************************************************************
Mon Sep 06 10:13:52.85  : 872 : E : Dependability : Dep_Info :  <INFORMATION: Services starting up.  Release: HE600
Mon Sep 06 10:13:52.425 : 944 : I : Dependability : Dep_Info :  <SIEMENS Log Monitor Service: Service Starting.>
Mon Sep 06 10:13:52.906 : 872 : I : Dependability : Dep_Info :  <SIEMENS Service Monitor Service : Service Starting
Mon Sep 06 10:13:53.16  : 2320 : I : Dependability : Dep_Info :  <SIEMENS Trace Monitor Service: Service Starting.>
```

Figure 12-5 `log.txt` File

3. If a required service has not been started, then the HiPath ComScendo service should be stopped and restarted using the State Viewer.

   If the State Viewer has no connection to the HiPath 5000 server, the "Siemens Service Monitor Service" should be restarted. To do this, click the "Start Server" button (see Figure 12-3).

   If this does not work either, the HiPath ComScendo Service software must be uninstalled and then reinstalled using the instructions set out in Section 6.6.4.

   If problems arise during operation (crashes, incorrect telephone responses, etc.) contact the relevant service support organization. The `*.trc` and `*.dmp` files stored in the `diag` subdirectory of the installation directory should also be supplied to service support for diagnostic purposes.

12.3.1.11 HiPath Fault Management

HiPath 3000 and HiPath 5000 systems have a separate SNMP agent that allows access to various system data that is stored in its MIB or Management Information database. The MIB provides basic system information, status information, event-related data, and information on installed hardware (slots) and configured connections (ports).

HiPath Fault Management can read information from the HiPath 3000 and HiPath 5000 system MIB via SNMP requests. This allows the system to permanently monitor the status of the network components and to include changes of status in the network administrator information.

A graphic map of the network displays the topology and the current status of the network components.

For detailed information, refer to the product-specific documentation for HiPath Fault Management.

SNMP functions

Simple Network Management Protocol (SNMP) represents a convenient platform within the TCP/IP protocol family for management tasks in the HiPath 3000 and HiPath 5000 software. SNMP is used more or less as a management agent on HiPath 3000 and HiPath 5000 and handles central monitoring and administration of LAN network components, including the HiPath 3000 and HiPath 5000. It is possible to

- address the HiPath 3000 and HiPath 5000 over the TCP/IP protocol family.
- access data from external management applications such as HiPath Fault Management.
- implement remote maintenance jobs (such as online port status, disabling and enabling ports, and determining free ports).
- transmit service-related Class B errors.
- visualize the operating status of a HiPath 3000 and HiPath 5000.

12.3.1.12 Licensing Analysis

> This documentation does not cover interpretation of the analysis data. Trace files, log files, etc. are used for problem analysis and are interpreted by Service Support during servicing.

12.3.1.12.1 Analysis Using Customer License Manager (CLM)

The CLM installation directory (for example, `C:\Program Files\licensing\license manager`) contains the `Trace` directory among other things. Each time the TomCat Web server is started, a new subdirectory is created to which the trace output is then written. Trace output can be viewed using MS Internet Explorer.

You can define the size of the trace files as well as the degree of detail of a trace in a configuration file (in the example `C:\Program Files\licensing\license manager\Apache Tomcat\ClmSettings.xml`):

```
<TraceFilesQuantity>3</TraceFilesQuantity>
```
This value (for example 3) indicates how many trace files are used cyclically.

```
<TraceFileEntries>1000</TraceFileEntries>
```
This value (for example 1000) defines the maximum number of trace entries per trace file.

```
<TraceLevel>4</TraceLevel>
```
This value (1 – 8) defines the degree of detail: 1 = Low (important events only), 4 = Standard (including external interfaces), 8 = All.

12.3.1.12.2 Analysis Using Customer License Agent (CLA)

The CLA offers two analysis options:

Log files

The Customer License Agent (CLA) manages a configuration log and error log. Both logs are viewed using the CLM. This provides a good overview of an error situation that helps to narrow down an error to a specific area, for example.

Trace files

The CLA records detailed information about its internal processes in a text file that is stored in the `bin` subdirectory of its installation directory. The degree of detail (off, low, standard, all) and the size (in MB) of this recorded information can be defined using the Customer License Manager (CLM).

Extensive reconstruction of an error is generally made possible by setting 100 MB for the size and a “standard” degree of detail.

12.3.1.13 Analysis Using HiPath Software Manager and HiPath Inventory Manager

> This documentation does not cover interpretation of the analysis data. Trace files, log files, etc. are used for problem analysis and are interpreted by Service Support during servicing.

Trace files

The installation directory of the Common Web Service (default = `C:\Program Files\siemens\hipath\commonweb`) contains, among other things, the `Trace` directory, in which the trace files for the Web applications HiPath Software Manager and HiPath Inventory Manager are stored.

This directory name is saved in a registry key during installation. If this key cannot be accessed, the trace files are stored in the temporary system directory (as the Common Web Service is started as a system service). Under MS Windows 2000, this directory normally has the name `C:\WINNT\temp`, while under MS Windows 2003 it is called `C:\WINDOWS\temp`.

Each time a Web application is started by the Common Web Service (TomCat Web server), a separate subdirectory is created. This subdirectory contains the trace files in XML format. The subdirectory name follows the convention `date_<DATE>_time_<TIME>`.

In order to enable service support to perform diagnosis, the complete `Trace` directory must be made available. Adaptations for more detailed traces can be made in consultation with service support using the CFG files in the `config` directory. These adaptations refer to the degree of detail (level) of the trace file and application options for the components of all Web applications.

Inventory diagnosis data

When the HiPath Inventory Manager is operated with the “verbose mode” flag set (on the settings page), the following XML files are saved in the temporary directory of the system (see above):

- `swmreport.xml` – contains the information generated during an update of the system information by the HiPath Software Manager.
- `invdataos.xml` – contains the data for the operating system for the last update.
- `invdatasnmp.xml` – contains the data for the HiPath 3000/5000 network from the last update.
- `invdataapps.xml` – contains the data for the applications from the last update.
- `invdatamaster.xml` – contains the data for the master setup from the last update.

12.3.2 HiPath 3000 Error Messages (Entries in the Eventlog for HiPath 3000)

Classification

Accrued errors are classified according to error class and error number. The three different error classes are described below:

- **Error Class A** = Customer-related error
  HiPath 3000 Manager E fails to issue a signal/message. Class A errors are indicated on the optiPoint Attendant display. They can be corrected by the customer without service support.

  The following error messages are implemented at present:

  - "Printer Alarm" (caused by paper out, for example)
  - "Fan Failure" (caused by failure of the fan with HiPath 3500 or HiPath 3300)
  - "Revisor Alarm" (caused by overflow of the log part of the MMC, for example).
  - "Too Many Key Modules" (caused by attaching more than the maximum possible number of optiPoint key modules specified in Table 10-3)
- **Error Class B** = Service-related errors
  HiPath 3000 Manager E signals Class B errors, which can be automatically forwarded to a service center.
  Errors of this class are, for example, failure of the boards, individual ports, or trunks. You can generally correct these errors by replacing the hardware, re-configuring the customer database, or by working together with the carrier. Table 12-7 lists all Class B errors.
- **Error Class C** = Development-related errors
  HiPath 3000 Manager E fails to issue a signal/message.
  Class C errors require diagnosis and problem analysis by specialists.

Class B Error Messages

The actions for correcting errors (specified in the table below) are described as follows:

- Recovery Action
  Action for correcting errors that are automatically triggered by the system software (for example board reload).
- Technician Action
  Action that has to be performed by a service technician if the error is not corrected automatically. This may be the case with hardware malfunctions or configuration errors.

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
Error Class B-01 - HiPath 3000 Manager E			
3	Hard restart	Hard restart	–
10	Hard restart using SNMP	Hard restart	–
14	"On site" changes to the database	–	–
15	"Remote" changes to the database (remote service)	–	–
16	APS transfer acknowledgement message	–	–
17	No authorization to access IP address on HiPath 3000 (IP add. in data[1...4])	–	Unauthorized access attempt. If necessary, configure SNMP community/application firewall.
18	Overflow in the MMC log area (log file)	–	Read out log file
19	Sensor alarm: Fan failure (19" housing for HiPath 3500/HiPath 3300)	–	Check to see if the fan has broken down and/or if the ventilation openings in the housing are unblocked.
20	Overflow in the CDR buffer (CDR information)	–	Check interfaces (V.24, LAN)
21	Error when identifying (name) and authenticating (password): from HiPath 3000 Manager E –> Data[0] = 0, Data[1..9] = call number number -> Data[0] = 1, Data[1..4] = IP address	–	Unauthorized access attempt. If necessary, configure SNMP community.
22	Flash area deleted	–	APS transfer possible again
23	SNMP process stopped	–	Perform hard restart
24	No access authorization for IP application (IP add. in data[1...4])	–	Unauthorized access attempt. If necessary, configure application firewall (IP address/application flag).

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
Error Class B-09 - Hardware			
0	Microprocessor: Error	Reload board	Replace board
1	Microprocessor: Error corrected	–	–
2	Loadware RAM: Error	Reload board	Replace board
3	Loadware RAM: Error corrected	–	–
29	Line interruption	–	Check line
30	Short circuit	–	Check line
31	Under voltage	–	Check voltage
32	Thermal overload	–	–
34	Frame loss S_0: Error	–	Check line
35	Frame loss S_0: Error corrected	–	–
36	Data slip S_0: Error	–	Check line
37	Data slip S_0: Error corrected	–	–
38	Alarm display S_{2M}: Error	–	Check line
39	Alarm display S_{2M}: Error corrected	–	–
42	No signal S_{2M}: Error	–	Check line
43	No signal S_{2M}: Error corrected	–	–
44	Receiver remote alarm S_{2M}: Error	–	Check line
45	Receiver remote alarm S_{2M}: Error corrected	–	–
48	Bit rate error S_{2M}: Error	–	Check line
49	Bit rate error S_{2M}: Error corrected	–	–
50	Loss of synchronization S_{2M}: Error	–	Check line
51	Loss of synchronization S_{2M}: Error corrected	–	–
58	Board self-test $U_{P0/E}$: Error	–	Replace board
59	Board self-test $U_{P0/E}$: Error corrected	–	–
61	Overcurrent $U_{P0/E}$: Error	–	Replace board
62	Overcurrent $U_{P0/E}$: Error corrected	–	–
65	Out of buffers $U_{P0/E}$/CMI: Error	–	–

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
66	Out of buffers $U_{P0/E}$/CMI: Error corrected	–	–
Error Class B-11 - General Errors			
58	Too many layer 1 errors	–	Check line, possibly replace board
Error Class B-12 - Processor Exception			
0	Reset initial stack pointer	Hard restart	Notify appropriate service support
1	Reset initial program counter	Hard restart	
2	Interrupt access error	Hard restart	
3	Interrupt address error	Hard restart	
4	Interrupt, command not permitted	Hard restart	
5	Interrupt, division by zero	Hard restart	
6	Invalid opcode exception	Hard restart	
7	TRAP C or TRAP V instruction	Hard restart	
8	Security violation	Hard restart	
9	Trace	Hard restart	
10	Line 1010 emulator	Hard restart	
11	Line 1111 emulator	Hard restart	
12	HW breakpoint (CBFC: possible EXTEB error)	Hard restart	
13	Co-processor, security violation	Hard restart	
14	Formatting error, unwanted interruption	Hard restart	
15	Formatting error, unwanted interruption	Hard restart	
Error Class B-15 - APS Transfer			
0	APS transfer successful	APS transfer	–
1	APS transfer successful, CDB OK	–	–
2	APS transfer successful, default CDB loaded	–	–

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
3	Error in CRC checksum	–	Check transferred APS version and re-transfer APS. If error is still present, replace MMC module.
4	Return to old APS, default CDB loaded	–	
5	Return to old APS, old CDB loaded	–	
6	APS Transfer disconnect	–	Transfer APS again
7	Country data successfully transferred	–	–
8	Error occurred when deleting old APS on MMC	–	Transfer APS again. If error is still present, replace MMC module.
9	Block length error during APS transfer	–	Transfer APS again
10	Remaining length error during APS transfer	–	Transfer APS again
Error Class B-16 - General Errors			
1	Error in pool administration (rel_pool_ele)	Hard restart	Notify appropriate service support
2	Error in pool administration (get_trans_store)	Hard restart	
3	Error in pool administration (get_trans_store)	Hard restart	
4	Error during COSMOS send call	Hard restart	
5	Error during COSMOS timer call	Hard restart	
6	Error during COSMOS receive call	Hard restart	
7	COSMOS records error (recovery)	Hard restart	
8	Error while handling real-time clock	–	
9	Watchdog error	Hard restart	
10	Manual hard restart	–	–
11	Manual reload	–	–
12	System had no voltage	–	Notify appropriate service support
13	Automatic customer data backup (CDB backup) not performed	–	
14	Unidentified hard restart	–	–

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
15	Error when generating log file	–	Notify appropriate service support
16	Pool error	–	
17	CTXT acceptance error	–	
20	Required data length exceeds permitted range	Hard restart	
21	Allocation fails	Hard restart	
23	Cold restart	–	–
24	Idle status reached following restart	–	–
25	Licensing error	–	Check licensing
Error Class B-18 - Database Events			
12	HiPath License Management: Grace period was started.		Perform licensing with RLF (Real License File)
13	HiPath License Management: Grace period was stopped. Licensing is OK.		–
14	HiPath License Management: Grace period was stopped. System in licensing default		Perform licensing
15	HiPath License Management: MAC ID error		Check the MAC address
16	HiPath License Management: 30-day period until licensing of the specified feature expires was started.		Renew licensing
17	HiPath License Management: Licensing of the specified feature expired.		Renew licensing
18	HiPath License Management: System in licensing default		Perform licensing
19	HiPath License Management: Invalid licensing		Check licensing data
20	HiPath License Management: License Failure Period was started.		Check connection of the system to the Feature Server (DBFS)
21	HiPath License Management: License Failure Period was stopped. Licensing is OK.		–

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
22	HiPath License Management: License Failure Period was stopped. System in licensing default		Check licensing
Error Class B-20 - Call Processing			
0	Error in pointer administration	Hard restart	Notify appropriate service support
1	Maximum number of stations achieved	–	Reduce stations
2	RS232: Interface not present (DSR)	–	Check interface
11	RS232: Interface ready (DSR)	–	–
13	All routes allocated	Hard restart	Notify appropriate service support
Error Class B-21 - Device Handler			
0	No dial tone detected	–	Use headset to check dial tone. If there is no dial tone, replace board.
1	Dial tone detected	–	–
7	Reference clock on	–	–
8	Reference clock off	–	–
11	Fan alarm (19” housing for HiPath 3500/ HiPath 3300): Error	–	Check to see if the fan has broken down and/or if the ventilation openings in the housing are unblocked.
12	Fan alarm (19” housing for HiPath 3500/ HiPath 3300): Error corrected	–	–
13	No response from temperature sensor in the 19” housing for HiPath 3500/HiPath 3300	–	Replace CBRC

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
14	Overload Code Receiver CR	–	Check if these errors occur repeatedly or only sporadically. If the errors occur repeatedly, an additional CR8N board can be used for HiPath 3750 and HiPath 3700. An upgrade to the next highest system may be necessary for all other systems.
15	Overload Code Sender CS	–	
Error Class B-23 - Network			
60	System hold no buffer available	Hard restart	Notify appropriate service support
Error Class B-26 - Presence			
0	Unknown card type	–	Replace board
1	Board out of order	Reload board	–
2	Maximum number of peripheral boards exceeded	–	Reduce peripheral boards to maximum number
3	Board type not compatible, slot is already pre-assigned with a different board model	–	Replace board
4	Board is activated	–	–
Error Class B-28 - Recovery			
0	COSMOS error: Data transmission not possible	Hard restart	Notify appropriate service support
Error Class B-29 - IOP			
0	COSMOS error	Hard restart	Notify appropriate service support
20	Port table queue is empty	Hard restart	
24	Board malfunction	Reload board	–
25	Board reset was detected	Reload board	–

Table 12-7 HiPath 3000 Class B Error Messages

No.	Meaning	Action Recovery	Action Technician
35	No ELIC interrupts	Hard restart	Notify appropriate service support
36	SDRAM: Access to protected area	Hard restart	
37	SDRAM: Write error, wrong address	Hard restart	
38	SDRAM: Read error, wrong address	–	
Error Class B-30 - Firmware/Loadware			
6	HDLC Controller Error on board	Reload board	Replace board
Error Class B-40 - MMC			
0	MMC defective	Hard restart	Replace MMC
Error Class B-41 - LAN			
4	Send: Ethernet driver not ready	–	For errors that appear sporadically, no action is necessary. For errors that appear regularly, replace the LIM module. If this does not correct the error, check the LAN configuration.
8	Send: More than 15 futile attempts	–	
9	Send: Delayed collision detection	–	
10	Send: Carrier loss	–	
11	Receive: Frame error	–	
12	Receive: FIFO error	–	
13	Receive: Checksum error	–	
14	Receive: Defective receiving buffer	–	
15	Receive: Frame too short	–	
16	Receive: Frame too long	–	
17	Receive: Delayed collision detection	–	
18	Receive: Partial deletion of data due to the existing write protection	–	

12.3.3 HiPath 5000 Error Messages (Event Viewer Entries for HiPath 5000)

Table 12-8 lists the possible entries for HiPath 5000 in the Event Viewer.

The **Source** column designates the origin of the possible entries:

- HiPath AllServe = Feature Server events
- GetAccount = GetAccount events
- PCM = HiPath Manager PCM events

The various components of these sources are identified by means of the abbreviations in the **Category** column. Section 6.3 contains information about the most important components of the Feature Server.

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1000	X	Not defined	Unidentified logical TFTP error in HiPath 3000/5000			adm	HiPath AllServe
1010	X	Socket error	General socket error	Save event file for error analysis	Shut down and restart server. If error is still present, restart the PC.	adm	HiPath AllServe
1011	X	Udp/tftp: unknown service	Logical socket error, unable to install Winsock Library	Save event file for error analysis	Unrecoverable error. Restart server and report error to appropriate service support.	adm	HiPath AllServe
1013	X	WSA socket error	General socket error	Save event file for error analysis	Unrecoverable error. Restart server and report error to appropriate service support.	adm/ car	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1014	X	File open error	Logical TFTP error; HiPath 3000/5000 displays a message indicating that frame page cannot be opened		Wait 5 minutes then repeat action.	adm	HiPath AllServe
1015	X	Error while setsockopt.	Server problem: IP socket could not be initialized	Save event file for error analysis	Shut down and restart server. If error is still present, restart the PC.	adm	HiPath AllServe
1016	X	Error while recvfrom.	HiPath 3000/5000 no longer replies when files are received	Save event file for error analysis	Connection error, HiPath 3000/5000 HIP problems. Check if ping is working: If ping is working: wait 5 mins and restart server. If ping is not working properly, check if the “Ping unsuccessful” error message appears in the Event Viewer.	adm	HiPath AllServe
1017	X	Error while sending to <IP-Adr>	Logical error when sending data to HiPath 3000/5000	Save event file for error analysis	Unrecoverable error. Restart server and report error to appropriate service support.	adm	HiPath AllServe
1018	X	Transfer timed out	No acknowledgement received/sent	Save event file for error analysis	Possible connection interruption or HiPath 3000/5000 HIP problems.	adm	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1019	X	Discarded packets	TFTP protocol error: data transfer no longer possible, transfer cancelled.	Save event file for error analysis	Unrecoverable error. Check if ping is working: If ping is working: wait 5 mins and restart server. If ping is not working properly, check if the “Ping unsuccessful” error message appears in the Event Viewer.	adm	HiPath AllServe
1020		Receive successful	CDB page frame successful (read)		Information	adm	HiPath AllServe
1021		Send successful	CDB page frame successful (write); Event Properties contains the corresponding page frame ID		Information	fct/ adm	HiPath AllServe
1022		Connect successful	Positive ack. from FCT; connection with HiPath 3000/5000 successful; Event Properties contains the corresponding HIP address		Information	fct/ adm	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1023	X	Socket not connected	Connection difficulties - HiPath 3000/5000 server. TCP connection not available	Save event file for error analysis	Check LAN, initiate HiPath 3000/5000 ping. Restart server if necessary. Check HiPath 3000/5000 HIP.	fct	HiPath AllServe
1024		CDB transfer successful (read)	All frame pages successfully read from HiPath 3000/5000 nodes by the server		Information	vsrv	HiPath AllServe
1025		CDB transfer successful (write)	All frame pages successfully written from the server to all HiPath 3000/5000 nodes		Information	vsrv	HiPath AllServe
1027		CallAddressTable and NodeIpTable transfer successful	Successful transfer of call address table and node IP table to the system by the server		Information	car	HiPath AllServe
1028	X	Venus database closed	Venus database closed		Information	vsrv	HiPath AllServe
1029	X	Venus Database started	Venus database started		Information	vsrv	HiPath AllServe
1030		Data saved to disk	Saving the Venus database to the server hard drive		Information	vsrv	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1031		Ping not possible	HiPath 3000/ 5000 HIP no longer available	Save event file for error analysis	Check HiPath 3000/ 5000. Check HG 1500. Check LAN. Initiate HiPath 3000/5000 ping, if necessary	adm/ fct/ vsrv/ sync	HiPath AllServe
1032	X	CDB transfer to (<IP-Adr>) failed (write)	Writing data to HiPath 3000/ 5000 with specified IP address failed	Save event file for error analysis	Check HiPath 3000/ 5000. Check HG 1500. Check LAN. Initiate HiPath 3000/5000 ping, if necessary. Load HiPath 3000 Manager E data to the server again. This initiates data transfer from the server to HiPath 3000/5000.	vsrv	HiPath AllServe
1033		Data sync tile	Modification to database in HiPath 3000/5000 reported to the server; HiPath 3000/5000 data loaded and saved on the server			adm	HiPath AllServe
1034		Disconnection of object recovered (%1)				sync	

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1036	X	CDB transfer from (<IP-Adr>) failed (read)	Data reading from HiPath 3000/5000 (with specified IP address in the server) failed	Save event file for error analysis	Check HiPath 3000/ 5000. Check HG 1500. Check LAN. Initiate HiPath 3000/5000 ping, if necessary. Activate HiPath 3000/5000 data loading via HiPath 3000 Manager E.	vsrv	HiPath AllServe
1037		Interface error (_hr= 0xzzzzzzzzz)	If 0xzzzzzzz = 0x80070057, this is just internal information for Development, otherwise error	Save event file for error analysis	If an error message appears, RgTraceFile.txt and Carlog File must be saved.	reg	HiPath AllServe
1038		User interface active on <IP-Adr>	The user interface is active during a sync. Trials are not cancelled and are cyclically repeated until successful.		Information	sync	HiPath AllServe
1039		User: “<username>” on PC: “<pc_name>”: read CDB data from server	HiPath 3000 Manager E information about user actions, user reads data from the server.		Information	vsrvadmin	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1039		User: “<username>” on PC: “<pc_name>”: write CDB data to server. Mode (delta)	HiPath 3000 Manager E information about user actions, user writes data to the server and to the systems.		Information	vsrvadmin	HiPath AllServe
1040		Node IP ADD <IP-Adr>			Error		HiPath AllServe
1041		No resources in system %1	API cannot open FCT, as there is another API session active (e.g. user interface).			fct	HiPath AllServe
1042		Regs message <IP-Adr>				vsrv	HiPath AllServe
1043		Car update node IP table entry <IP-Adr>	Database generates the node IP table per CDB for the car server		Information	vsrv	HiPath AllServe
1045	X	Feature Server: Service Started. Version HVxxxB.yy.nnn.	The "Feature Server" service was started.		Information	vdbast	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1045	X	Feature Server: Service stopped.	The "Feature Server" service was stopped.		Information	vdbast	HiPath AllServe
1046		Update CallAddressTable (No. = %1) and NodeIpTable (No. = %2)	CAR assigned a new call address and node IP table by the database (event 1027 follows).		Information	car	HiPath AllServe
1047		Registration request from <IP-Adr>	The REG server received a registration request from HG 1500.		Information	reg	HiPath AllServe
10000		Wrong request ID	Wrong UDP packet sequence, asynchronism.		Check LAN	fct	HiPath AllServe
10001		Unknown packet	Unknown HiPath 3000/5000 IP packet.		Information	fct	HiPath AllServe
10002	X	Socket receive	TCP socket error.	Save event file for error analysis	Possible interrupted connection.	fct	HiPath AllServe
515	X	Error 0x%x in Func \“SaveGeb\”. Description: %s”,e.Error(), (char*)(e.Description())	Error when saving an outgoing call data record.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	Error 0x%x in Func \xd2 SaveKommend\”. Description: %s”,e.Error(), (char*)(e.Description())	Error when saving an incoming data record.				GetAccount
515	X	Error 0x%x in Func \“SaveNewPrice\”. Description: %s”,e.Error(), (char*)(e.Description())	Error when saving a recalculated call data record.				GetAccount
515	X	Error init HKLM registry Stop service GetAccount	Error when reading start parameters from the HK local machine registry.				GetAccount
515	X	Error init registry HKCU Stop service GetAccount	Error when reading start parameters from the HK Current user registry.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	Error when starting immediate printout. Stop service GetAccount	Error when starting immediate printout thread.				GetAccount
515	X	Error 0x%x in Func \“InsertSofortDruck\”. Description: %s”,e.Error(), (char*)(e.Description())	Error when saving a record for immediate printout.				GetAccount
515	X	No CDR line found	TSP does not provide any CDR lines.				GetAccount
515	X	Error TAPI Init	Error when initializing the TAPI interface.				GetAccount
515	X	TapiFunc: %s ID: %d Error: %s”, szTapiFunc, lLineID, szErrorMess	Error when calling a TAPI function for a particular line.				GetAccount
515	X	TapiFunc: %s Error: %s”, szTapiFunc, szErrorMess	Error when calling a TAPI function.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	Box not found in database cntBox = 0 SwitchID: %d, nVNodeID: %d	Node data has not yet been read.				GetAccount
515	X	CDR Service in PBX: %d could not be started	The CDR service in the switch could not be started.				GetAccount
515	X	Error sending command 'starting CDR Service' to PBX: %d	Error when sending the start CDR service command.				GetAccount
514	X	CDR Service in PBX: %d by TSP already started	TSP has already started the CDR service.				GetAccount
515	X	Error starting CDR service on PBX: %d dwParam2: 0x%x	Undefined error when starting the CDR service.				GetAccount
515	X	Error sending command 'stop CDR Service’	Error when sending the command to stop the CDR service.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	Error stopping CDR Service: Illegal Access	Error when stopping the CDR service. Access denied. Someone else already started the service.				GetAccount
515	X	Error stopping CDR Service: ErrorCode: 0x%x”, dwParam2	Undefined error when stopping the CDR service.				GetAccount
513	X	TAPI Reinit	TAPI was reinitialized.				GetAccount
515	X	Start service error: Database connect error	Error when opening the database connection.				PCM
515	X	Start service error: Misc. database error	Error when reading out the values saved in the database.				PCM
515	X	LineInitialize: %s”, TapiErrorMess	Error during TAPI LineDevices initialization.				PCM
515	X	PhoneInitialize: %s”, TapiErrorMess	Error during TAPI PhoneDevices initialization.				PCM

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	PCM Service Start error: [dynamic error message]	General error when starting the service.				PCM
515	X	The PCM-Conn.clsPCMConn connection object could not be established.	Error creating object when starting the service.				PCM
515	X	The PCM service was cancelled because of unrecoverable error during initialization.	Service cancellation due to an unrecoverable error during initialization.				PCM

12.4 Correcting Errors

12.4.1 Automatic Error Correction

One of the below recovery actions is assigned to each error in the error memory. These recovery actions are programmed to automatically correct errors that occur.

- Hard restart
- Reload board
- Reload CDB backup
- Port lockout
- Power failure transfer (loop start)
- None

A watchdog activates continuous loops.

If no recovery measure is assigned or if the one that is assigned fails, a service technician has to correct the error manually.

12.4.2 Manual Error Correction Without HiPath 3000 Manager E

Manually activating a restart (reset)/reload

Pressing the reset button on the central control board of HiPath 3000

- initiates a **Reset** (hard restart of the entire system with the current CDB) if the button is pressed for less than 5 seconds. The RUN LED lights up when the Reset button is pressed.
- initiates a **Reload** if the button is pressed longer than 5 seconds. The Run LED disappears after approximately five seconds as verification that the reload has been initiated. The entire content of the customer database is replaced by its default version. All country and customer-specific settings are lost.

> If you initiated a system reload, the system must be reset after the CDB has been installed. This ensures that all signaling gateways (= HG 1500 gatekeeper) are reset.

Locking out and releasing boards and ports

You can lock out and release ports using the lockout switch located on the board. The lockout prevents renewed seizure after the current connection has finished. It creates

- a port lockout in an outgoing direction on analog trunk boards.
- a port lockout in outgoing and incoming directions on trunk boards.
- a lockout of the entire board for subscriber line modules.

12.4.3 Manual Error Correction With HiPath 3000 Manager E

Initiating Restart (Reset)

This initiates an immediate hard restart of the entire system with the current CDB.

Initiating Reload Card

This the single board (loading Loadware) to reload.

Locking out and releasing boards and ports

HiPath 3000 Manager E enables you to lock out an entire subscriber line module or line circuit module and individual ports. The lockout prevents renewed seizure after the current connection has finished. Release or lockout settings are also retained after a reset.

However, you cannot lock out the first SLMO/SLU board because administration through Assistant T runs on its first two ports.

When attempting to lock out the last active trunk, you are subsequently notified that remote service through the service center is no longer possible.

You cannot use HiPath 3000 Manager E to release boards and ports locked out with the lockout switch.

ALUM

You cannot initiate a power failure transfer to analog telephones using HiPath 3000 Manager E.

12.5 Remote Service

Definition

Remote service is described as communication between the service center and HiPath 3000 and HiPath 5000 using the public telecommunications network to fulfill service tasks. These tasks are

- remote system administration,
- remote administration of Plus products via the system,
- remote correction of system software (APS transfer),
- automatic signaling of error messages.

Remote service facilitates the administration and maintenance of various communication systems from a central location.

The connection to HiPath 3000 can be set up via the integrated digital modem (B channel), the integrated analog modem (IMODN) or the HG 1500.

Special software programs, such as pcANYWHERE, facilitate connections to HiPath 5000. If the customer agrees, Remote Access Service RAS can also be used, provided this service is active on the HiPath 5000 server.

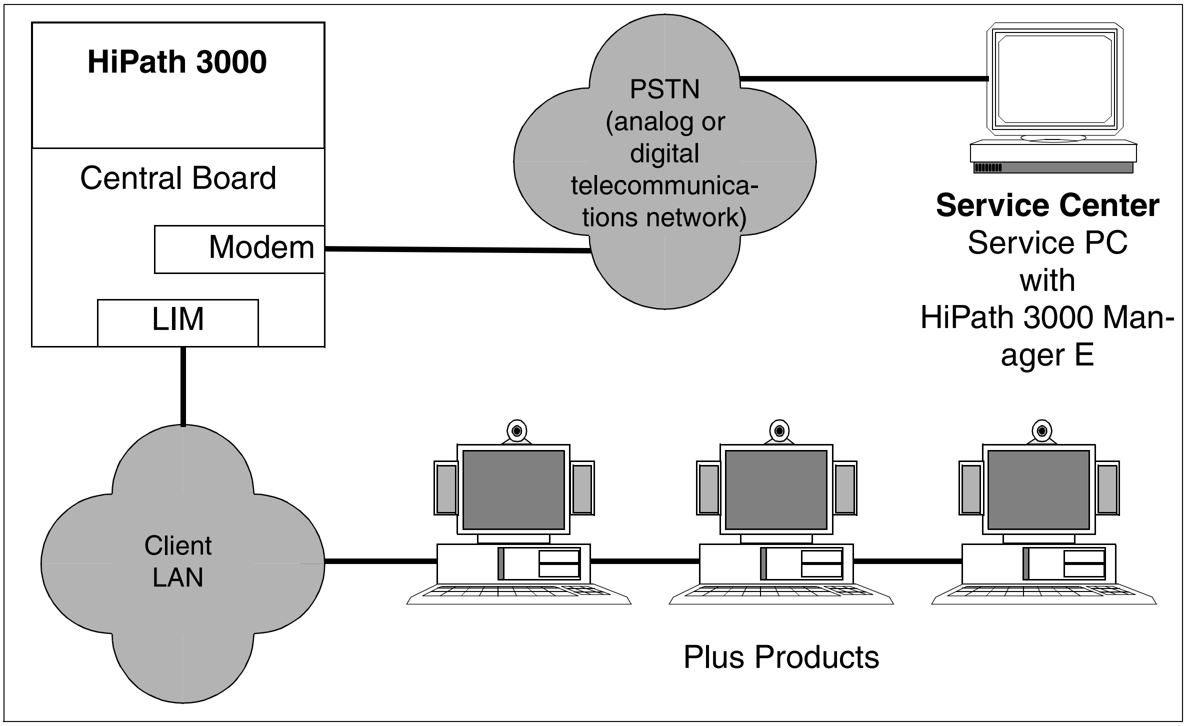

HiPath 3000
Central Board
Modem
LIM
PSTN (analog or digital telecommunications network)
Service Center
Service PC with HiPath 3000 Manager E
Client LAN
Plus Products

Figure 12-6 Example of Remote Service with HiPath 3000

12.5.1 HiPath 3000 Connection Options

- **HG 1500**
  All HiPath 3000 systems can be accessed remotely with a LAN-LAN link via the HG 1500 board. For information on configuration, refer to the HG 1500 Administration Manual.
- **Integrated analog modem IMODN**
  This modem enables remote access to all systems in the HiPath 3000 product line. Access is achieved using any trunks, tie trunks, and all subscriber lines. IMODN is designed as a plug-in card.

  > ⚠ **Caution**
  > Be sure to disconnect the system from the power supply before removing or inserting integrated analog modems (IMODN).

  The IMODN is treated as a pseudo port. It receives a number in the system that can be reached internally through direct internal dialing (DID). You can cancel the DID number manually to prevent external access.
- **Integrated digital modem (B Channel)**
  An integrated B channel modem is available with all systems in the HiPath 3000 product line. This type of modem facilitates remote access using both digital trunks, tie trunks, as well as S_0 subscriber lines. Data transmission is supported according to Protocol X.75.

  The digital modem is treated as a pseudo port. It receives a number in the system that can be reached internally and through direct internal dialing. You can cancel the DID number manually to prevent external access.

Baud rate settings
For information about setting the baud rate for different connection types between HiPath 3000 and HiPath 3000 Manager E, consult the Help for HiPath 3000 Manager E.

Access to the analog/digital modem
The customer must enable the access to both modems by entering a six-digit PIN code. If the service center is to make a connection to the HiPath 3000 over a modem, it may be necessary to enter this individual code. It depends on which trunk type is used for the modem access. The following applies to the system default:

- Access over ISDN trunk = enable procedure: customer must enter PIN code.
- Access over another trunk = login without code: PIN code is not necessary.

If necessary, the system administration (only by using Assistant T) can reset the PIN code back to the default value.

12.5.2 HiPath 5000 Connection Options

In general, the connection to HiPath 5000 is established via special software programs, such as pcANYWHERE. Please refer to the relevant product documentation for information on possible applications.

If the customer agrees, Remote Access Service RAS can also be used, provided this service is active on the HiPath 5000 server. Information on establishing the Remote Access Service (RAS) can be obtained from the HG 1500 Administration Manual.

12.5.3 Remote System Administration

12.5.3.1 Remote Administration of HiPath 3000 with HiPath 3000 Manager E

To establish a remote connection between HiPath 3000 and the service center (HiPath 3000 Manager E), the following options are available:

- Callback
- Service call via code
- Automatic error signaling

Any one of these options establishes a connection using the integrated digital modem (B channel) or the integrated analog modem (IMODN).

Callback

HiPath 3000 can manage up to six different callback indices (callback passwords and their relevant callback numbers), in which case the first callback connection is also the destination of the automatic error signaling. For each callback connection, you can select either the digital modem (B channel) or the analog modem (IMODN).

If you have chosen your settings and selected the connection setup option “Callback activated”, the HiPath 3000 Manager E can dial in to the system. HiPath 3000 registers the callback destination and saves the callback index. After 10 s, the HiPath 3000 initiates the actual callback with the number which is linked using the callback index. As soon as the connection is established, you can use HiPath 3000 Manager E to manage the system.

If no connection is established, HiPath 3000 will make a total of 20 attempts in intervals of 10 s after which the callback attempt ends and has to be started up again with HiPath 3000 Manager E.

Service call via code

You can use any telephone to initiate a HiPath 3000 service call to the service center by selecting the connection setup option “Service call via code” and activating the feature “Remote access immediately after installation”. In contrast to the usual callback procedure, this callback (service call) is not activated by HiPath 3000 Manager E itself, but by any telephone you choose. Callback initialization is essentially skipped.

The service call destinations are the six callback indices that also apply to callback. You are not required to enter the relevant passwords.

The service center wait time for one service call is limited to 15 minutes, though you can end it manually at any time.

Procedure: Activate the feature “Remote access immediately after installation”.

Step	Entry	Description
1.	*994	Enter code for “Remote access immediately after installation”
2.	X	Select callback index (0 ... 6 possible)
3.	XXXXXXX	Select a suffix number if necessary (up to 11 digits) The suffix is used for selecting the remote PC in the service center.
4.	✓ or #	Press “OK” or the “#” button.

Automatic error signaling

Class B errors can be automatically transferred to a service center. For more information on this, see Section 12.5.5.

12.5.3.2 DTMF Remote Administration of HiPath 3000

This feature facilitates remote system administration by transmitting DTMF signals. The user interface (menu prompt) is the same as that of the Assistant T for system administration on site.

DTMF remote administration can be performed using either analog or digital trunks.

12.5.4 Remote Correction of System Software (APS)

The service center performs the APS transfer (see Section 12.2.3).

12.5.5 Remote Error Signaling

Class B errors can be automatically transferred to a service center. For this, the "Error-Signaling" flag must be activated and a number entered under the callback index 1.

To register an error message, the HiPath 3000 Manager E that is dialed at the service center must be in Receive mode. If an error message is received, the HiPath 3000 Manager E automatically creates a file in which the error is entered. If another error occurs, it is entered in the same file behind the previous entry.

The error report consists of one header and the error information that is transmitted in binary form. The header contains a unique identifier that recognizes the customer system that sent the error reports.

⚠ **Caution**
In case of a power outage, the not battery-buffered SDRAM content of the MMC is completely lost. Any individual settings made for the time parameter “error signaling interval” are also reset to the default value 15 minutes.
When the system is restarted, the automatic recovery action “reload CDB backup” starts and the customer-individual settings are reloaded. Because this process lasts longer than 15 minutes, the first error message is always signaled at the end of the 15-minutes default interval. All other errors are then signaled again with the individually set interval.
Example: The error signaling interval of a HiPath 3550 with activated error signaling was set to 90 s. After a power outage, the 90 s interval reverts to the default value of 15 minutes. The first error message “no voltage” is signaled 15 minutes after restarting operation of the system. After conclusion of the recovery action “reload CDB backup”, the original 90 s setting of the error signaling interval is reactivated. All other errors are signaled after 90 s.

12.5.6 Controlled Release of a Remote Connection

With version 1.2 and later, you can initiate the controlled release of a remote connection (with analog or digital modem) between the HiPath 3000 and HiPath 3000 Manager E as follows:

- Disconnect according to action (Default setting)
  After completing an action (e.g. CDB backup or APS transfer), the remote connection is automatically disconnected.
- Disconnect according to release time
  After completing an action (CDB backup or APS transfer, for example) and the adjustable release time sequence (60 ... 9999 s), the remote connection is disconnected.
- “Hang up” button
  By pressing this button, you can disconnect the remote connection manually.

Use HiPath 3000 Manager E to select any one of these options.

12.5.7 Remote Administration and Access Using PPP

You can establish a connection between the system/Plus product and the service center using either the integrated digital modem (B channel) or the integrated analog modem (IMODN). Data is exchanged in both cases using Point-to-Point-Protocols (PPP).

For further information see "Features via LAN" in the HiPath 3000/5000 Feature Description.

12.5.7.1 Remote System Administration

You can also operate HiPath 3000 Manager E in conjunction with the relevant infrastructure (RDT network, router) using PPP.

For further information, see "Remote Administration of HiPath 3000 via PPP" in the HiPath 3000/5000 Feature Description.

12.5.7.2 Remote Administration of Plus Products

You can manage Plus products from a central location using HiPath 3000. However, HiPath 3000 only provides the means of transmission. The Plus product is actually administered using special software programs like pcANYWHERE.

For further information, see "Remote Administration of Plus Products via PPP" in the HiPath 3000/5000 Feature Description.

12.5.7.3 Remote Error Signaling Using SNMP

Plus products and the HiPath 3000 can transmit error messages (SNMP traps) to the service center.

For further information, see "SNMP Functionality" in the HiPath 3000/5000 Feature Description.

12.6 Security Features

12.6.1 Access Security

12.6.1.1 Logon With User Name and Password

Security

To ensure that authorized users have access to the HiPath 3000 and to prevent unauthorized access, users must be identified by a user name and authorized by a password. This applies to all local and remote administration and maintenance procedures using HiPath 3000 Manager E, Assistant T, HiPath 3000 Manager C, Assistant TC, and AMHOST.

After the first system startup and during country initialization, you can select between the following security options:

- variable password (default)
- fixed password concept

Example of first-time login with Assistant T

Step	Entry	Description
1.	*95	Start system administration
2.	31994	Default user name
3.	31994	Default password

> Alphanumeric characters can be used with optiset E memory and optiPoint 600 office telephones only. Therefore, when changing the user name or password with the Assistant T/Assistant TC, you may enter additional characters as long as you never use the optiset E memory and optiPoint 600 office.

Step	Entry	Description
4.	XXXXX	You are prompted to enter a new password (max. 15 digits)
5.	XXXXX	You are prompted to confirm the password entered in step 4.
6.	29 - 5	Country initialization
7.	X	You are prompted to select the password type: 1 = Variable password 2 = Fixed password

Step	Entry	Description
8.	XX	You are prompted to enter the country code (see Page A-24). The system then boots up with the country-specific default information.
Notes: ● On step 4 and step 5: If a new password is issued, both steps are omitted when calling the system again. ● On step 6: No country adjustment is necessary for Germany because the system starts up with German codes. ● On step 7: When selecting the fixed password, the default password (31994) overwrites the new password entered under step 4.		

Variable password concept

Up to 16 users can be assigned their own user ID with individual name, password, and a user group consisting of six pre-determined user groups (in Table 12-9). Only the data authorized for the relevant user group can be read and administrated.

During the first login, the system requests the identity of the user and asks for a new password (max. 15 characters from the optiPoint 500 or optiset E character set). This then overwrites the default user name (31994) and default password (31994). This first user is then automatically assigned to the user group “System Maintenance”. The system informs the user that no user is configured in the system and that the user has been assigned with “System Maintenance” authorization. Using HiPath 3000 Manager E or Assistant T, additional users and their passwords can be configured in the user administration.

If a user forgets a password, it has to be deleted and re-configured by a different authorized user. If all authorized users forget their passwords, the system must be regenerated.

Fixed password concept

When using a fixed password, only fixed user groups with unchangeable default user names and default passwords are used. Also, new users cannot be configured in the user administration.

Changing password types

Only with Assistant T can you change from a variable password to a fixed password type and vice versa. To do this, you have to re-initialize the country settings. This switches the entire content of the customer database (including user names and passwords) to a default state.

If you perform country initialization in a system with a variable password, the previously created user names and passwords remain intact as long as you do not subsequently change the password type.

If a CDB is read from a system in which the default user names and passwords were changed, this CDB cannot be loaded into a HiPath 3000 system that was changed to a fixed password type. Before reading this CDB, you have to set up a user (user name and password) in the system that matches a user group with a fixed password. Once this user has been set up, the CDB can be read from the HiPath 3000. With this user name and ID, you can now load the CDB into the system switched to the fixed password type.

12.6.1.2 Pre-Determined User Groups and Their Access Rights

User groups with a variable password

The following table shows the six pre-determined user groups and their access rights.

Table 12-9 Variable password concept: Pre-Determined User Groups and Their Access Rights

No.	User groups / User rights	User admin.	Audit	System maint. (Service)	Customer admin. (Cust.)	Charge accounting	Develop-ment
1.	• Setting up/deleting users • Assigning users to user groups	X		X[1]			
2.	• Assessing and archiving backup-related log files • Reader rights to system data (error memory, for example), not including confidential customer information		X	X[2]			
3.	• Access rights to all system data (not including development access rights) as long as no users are assigned to other user groups.			X			
4.	• Access rights to confidential customer information • Executing customer actions (printing out certain lists, for example)			X[3]	X		
5.	• Access rights to non-confidential customer information			X	X		
6.	• Access rights to parameters and call detail recording actions (not including interface parameters for the output device)			X[3, 4]	X[4]	X	
7.	• Access rights of the “System Maintenance” user group • Setting up and reading certain parameters to which no other user group has access.						X

[1] As long as no user is assigned to the “User Administration” user group.
[2] As long as no user is assigned to the “Audit” user group.
[3] As long as no user is assigned to the “Customer administration” user group.
[4] As long as no user is assigned to the “Accounting” user group.

User groups with a fixed password

The following table shows fixed (unchangeable) user groups and their rights.

Table 12-10 Fixed Password: Fixed User Groups and Their Access Rights

No.	**User groups** **User rights**	**System maint. (Service) Name/Password= 31994/31994**	**Customer admin. (Cust.) Name/Password: – Manager TC=*95/(Password not necessary) – Manager C=office/office**	**Development**
1.	• Assessing and archiving backup-related log files • Reader rights to system data (error memory, for example), not including confidential customer information	X		X
2.	• Access rights to all system data (not including development access rights)	X		X
3.	• Access rights to confidential customer information • Executing customer actions (printing out certain lists, for example)	X	X	X
4.	• Access rights to non-confidential customer information	X	X	X
5.	• Access rights to parameters and call detail recording actions (not including interface parameters for the output device)		X	
6.	• Setting up and reading certain parameters to which no other user group has access.			X

12.6.1.3 System Access Options

The user’s access rights, meaning the data that the user may read or manage, always depend on the user group to which the user is assigned.

Service tools

- Assistant T and Assistant TC systems
  Log on by entering your user name and password (regardless of code lock)
  The system can only be accessed using the first two $U_{P0/E}$ connections from the first SLMO/SLU board in the system.
- HiPath 3000 Manager E and HiPath 3000 Manager C (local)
  Log on by entering your user name and password
- HiPath 3000 Manager E (remote), direct connection
  Log on by entering your user name and password
  The system can be accessed directly using the integrated digital modem (B channel) or the integrated analog modem. However, the user is required to establish a 5 digit access code beforehand.
- HiPath 3000 Manager E (remote), callback connection
  Log on by entering your user name and password
  The system can be accessed using the integrated digital modem (B channel) or the integrated analog modem. However, you have to set up a callback index beforehand.
- HiPath Software Manager
  Log on by entering your user name and password

AMHOST

The AMHOST (Administration and Maintenance via HOST) feature allows Plus products to read certain system information and to change it, if necessary. To enable Plus products to access the system, you have to set up a user without a user group in the HiPath 3000 default user administration. Enter “AMHOST” as the user name and “77777” as the default user password.

You can only change this password if the system is configured using a variable password. In this case, delete the “AMHOST” user and re-configure the system with the same user name and a new password.

12.6.1.4 Customer Data Security

When saving a customer database on the hard disk, a user table (part of the user administration) with user name and encrypted passwords are also saved. This guarantees access security when the customer database is opened offline later on.

When opening the customer database offline, you are requested to enter your user name and password. The data that you enter is compared to the data in the user table. In this case, the user group verified during this process also determines the access rights.

When loading an offline customer database into HiPath 3000, the user table that goes with it should not be loaded into the system. Otherwise, the system-specific user administration would be distorted.

> When you generate a default customer database offline, a default user table is also set up. If you generate a customer database like this, you can only load it into a default system.

12.6.2 Automatic Logging of Administration Procedures

Definition

All accesses to customer-related data in the HiPath 3000 are automatically logged in an area of the MMC (LOG area) reserved for this purpose. The information recorded includes who the user is, the data manipulated by the user, and the time. An authorized user (member of the “Revision” user group) can transfer the system data to a PC and assess it.

12.6.2.1 Logging

A log entry contains the following information:

- Date and time
- User name and user group
- Type of activity (format identification) and activity (command entry)

12.6.2.1.1 Format Identification and Command Entry

The following format information is logged:

- Assistant T (1)
  All activities are logged, regardless of system access. The respective code with the most important parameters is recorded as the command entry (station/number, for example).
- Assistant TC (2)
  Same as Assistant T (1)
- Session Information (3)
  The system access is logged, regardless of whether it is logged using Assistant T, HiPath 3000 Manager E, or other systems. Possible command entries are:
  A0-1 = Login procedure
  A0-2 = Logout procedure
  A0-3 = Unauthorized login attempt
- HiPath 3000 Manager E Database (4)
  Access to the database is logged using HiPath 3000 Manager E. Possible command entries are:
  A1-1 = Database read
  A1-2 = Regeneration of CDB (Load CDB into the system)
  A1-3 = Write database
- Program Systems (5)
  APS transfers and system boots (first bootup, for example) are recorded. Possible command entries are:

– A2-1 = APSXF started
– A2-2 = APSXF ended
– A2-3 = APS boot (APS stamp also included)

- HiPath 3000 Manager E Maintenance (6)
  Maintenance activities which can be assigned with the following command entries are logged:
  – B1-1 = Read error memory
  – B1-2 = Delete error memory
  – B2-1 = Out of service
  – B3-1 = Read Direct Memory Access
  – B3-2 = Write Direct Memory Access
  – B4-1 = Delete base station status overload
  – B4-2 = Delete base station restart
  – B5-1 = Digital loopback change
  – B6-1 = Trunk rolling change
  – B7-1 = Read trunk status
  – B8-1 = Delete trunk error counter

- Simulated or pseudo Assistant T format (7)
  The HiPath 3000 Manager E records the offline changes of a CDB as a “simulated” Assistant T command. For data areas subject to change by HiPath 3000 Manager E, pseudo areas are generated. When loading an offline CDB into the system, the following simulated commands are logged as command entries:
  C1 = Pseudo area “System parameter”
  – C1-1 System fags/CMI
  – C1-2 System intercept/AC
  – C1-3 Tones and calls
  – C1-4 Direction flag special (Variable direction#)
  – C1-5 System settings
  – C1-6 Host Link Interface
  – C1-7 Relocate activation
  C2 = Pseudo area “System timer”
  – C2-1 System timer
  C3 = Pseudo area “S_0 configuration”
  – C3-1 Station bus
  – C3-2 Line supervision
  – C3-3 Mode
  C4 = Pseudo area “Lines”
  – C4-1 Loop start parameter (Variable Slot/Line#)
  C5 = Pseudo area “Digit analysis”
  – C5-1 Internal number (Variable Stn#, Grp#)
  – C5-2 Service codes
  C6 = Pseudo area “Daylight saving time”
  – C6-1 Daylight saving time

C7 = Pseudo area “Routes”
– C7-1 Routing flags (Variable Trk Grp#)
C8 = Pseudo area “Door setup”
– C8-1 Door setup (Variable door#)
C9 = Pseudo area “UCD flags”
– C9-1 UCD flags
C10 = Pseudo area “Delete system counter”
– C10-1 Delete system counter

- HiPath 3000 Manager E online (8)
  Archives from the log file and the user administration are logged. Possible command entries are:
  – D1-1 = Archive
  – D2-1 = New user
  – D2-2 = Delete user
  – D3-1 = Change password

Logging External Accesses (Solutions, Applications)
Plus products used with “AMHOST” can only make limited changes. Because these changes “automatically” run simultaneously (Check In and Check Out for hotel solutions, for example), these are not logged. Only the session information (user name is “amhost”) with the command entries “Login procedure” and “Logout procedure” are logged.

12.6.2.2 Issuing and Saving Log Data

Data is automatically logged in an area (LOG area) on the MMC reserved for this purpose (HiPath 3000) or in a special directory (HiPath 5000). It cannot be switched off.

If approximately 80 % of the MMC log area capacity is exceeded, a Class A error is issued. This error is dealt with like all Class A errors and is displayed on the optiPoint Attendant as “Revisor Alarm.”

The log should now be read out and archived, meaning it should be saved in an archive file (file extension = arc). If an archive is not created, the oldest datablock is overwritten if there is a danger of overflow.

You can only issue log entries using HiPath 3000 Manager E. You cannot retrieve the log entries from the system until you have logged on as a user with “Revisor” rights.

Archive

If you request an archive (storage), the system checks whether or not there is already an archive file (file extension = arc). If it is a file with log data from a previous archive, the file must match the current customer. In case of a positive result, the system log entries are retrieved and attached to the existing data in the archive file. At the same time, the data in the system is deleted.
If malfunctions occur during this procedure (for example, line interruption), the entire procedure ends and the archive has to be restarted.

If no archive is requested, the revisor can retrieve, view, and print the log entries. However, log entries remain in the system.

You do not have to log on to the system to use the HiPath 3000 Manager E to check archive files on the PC monitor. In this case, a password is not required.

Multimedia card

When replacing the multimedia card, the following applies:

- If the memory area for logging data is empty, logging restarts.

- If the memory area for logging data is not empty, logging continues.

Example of a log printout

The following assumption applies as an example: The first system boot up has taken place. Customer-specific programming was completed.

```
1050   00-11-25 15:57:10   rev(R)    (6)D1-1          Archive
1051   00-11-25 15:58:22   rev(R)    (3)A0-2          Logout procedure
1052   00-11-26 09:20:15   serv(S)   (3)A0-1          Login procedure
1053   00-11-26 09:21:35   serv(S)   (4)A1-1          Database read
1054   00-11-26 09:21:52   serv(S)   (7)14-12-*(20)   Station name
1055   00-11-26 09:22:45   serv(S)   (4)A1-3          Write database
1056   00-11-26 09:23:25   serv(S)   (3)A0-2          Logout procedure
1057   00-11-26 10:10:15   pnkm(A)   (3)A0-1          Login procedure
1058   00-11-26 10:11:15   pnkm(A)   (2)14-12-”30”    Station name
1059   00-11-26 10:11:35   pnkm(A)   (2)14-12-”31”    Station name
1060   00-11-26 10:12:15   pnkm(A)   (3)A0-2          Logout procedure
1061   00-11-27 11:20:30   rev(R)    (3)A0-1          Login procedure
```

The sample printout (without consideration of headers and footers) refers to the following information concerning administration procedures:

- The Revisor (“rev” user in “R” (Revision) user group) has generated an initial archive.
- The Service (“serv” user in “S” (system maintenance) user group) has read out the system database, changed 20 station names, and rewritten them to the system.
- The Customer (“pnkm” user in “A” (Administration) user group) has changed two additional station names.
- The Revisor has retrieved the most recent log entries and printed them out.

13 IP Fundamentals

13.1 Overview

Chapter contents

This chapter discusses the topics listed in the following table.

Topic
IP Network Requirements, page 13-2
● General Introduction, page 13-2
● H.323 Protocol, page 13-2
● Standards Supported, page 13-3
● QoS - Quality of Service, page 13-4
Network analysis, page 13-6

ⓘ This section provides introductory information only and does not replace IP training.

13.2 IP Network Requirements

> For special requirements regarding bandwidth, delay, QoS, etc. for a HiPath 3000/5000 V5.0 customer IP network, please refer to the requirement specifications in the HiPath 3000/5000 solution contract.

13.2.1 General Introduction

A number of protocols play a role in data communication (X.25, Frame Relay, ATM and TCP/IP). The IP (Internet Protocol) switching layer is the Internet’s key protocol and permits interoperability with other networks and protocols, for example, Ethernet, X.25, Frame Relay and ATM. IP is consequently often used as a synonym for the technology as a whole. The protocols TCP, UDP and RTP are used by the various applications and requirements in the Internet, such as “File Transfer (FTP)”, “e-mail (SMTP)” and “WWW”.

RTP (Real Time Protocol) is used for voice transmission. The term “Voice over IP (VoIP)” indicates that the IP protocol is used to transport voice information.

There are nowadays various protocols that result from the efforts of diverse standardization bodies and standardization drives.

13.2.2 H.323 Protocol

H.323 encompasses the following subjects:

- Signaling (H.245, etc.)
- Video transmission
- Voice transmission/voice compression, for example
  - G.723.1 (5.3/6.3 Kbps)
  - G.729A (8 Kbps)
- Data applications (Application Sharing, T.120)

It is clear that this standard offers much more than just what is needed for voice transmission via data networks. H.323 was developed for multimedia applications.

13.2.3 Standards Supported

HiPath 3000/5000 V5.0 supports the standards listed in the following table.

Table 13-1 Standards Supported

Standard		Transmission rate[1]	Notes
G.711	ITU standard for voice codecs	64 Kbps	ISDN voice quality
G.722	High-quality voice codec	48, 56 or 64 Kbps	Better voice quality than G.711
G.723.1	ITU standard for voice codecs	5.3 or 6.3 Kbps	Adequate voice quality
G.729	Group of ITU standards for voice codecs	8 Kbps	Less delay and better voice quality than G.723.1
G.729A	ITU standard for voice codecs, based on G.729	8 Kbps	Less delay and better voice quality than G.723.1
G.729AB	ITU standard for voice codecs, based on G.729A	8 Kbps	Less delay and better voice quality than G.723.1
T.38	ITU standard for fax transmission (Realtime FAX)	14 Kbps	Governs communication from group 3 fax devices over IP networks

[1] The bandwidth actually required in the LAN, for example, may be considerably higher. Here are some relevant factors:
– Data Link Layer used: Ethernet (with or without VLAN), PPP, Frame Relay ...
– Protocols with/without compression: RTP, UDP, IP
– Security: VPN tunnel ...
– Redundancy: For example T.38
– Packaging: the number of samples that are transported per package.

“Clear Channel” transmission mode is characterized by the fact that signals are transmitted digitally and the connection is bit-transparent. There is no compression. The transmission rate is 64 Kbps.

13.2.4 QoS - Quality of Service

Introduction

Data transmission in IP networks can encounter:

- Time problems due to large e-mail attachments and web surfing
- Network bottlenecks as a result of multiple requests for the same web page
- Reduced voice quality due to:
  - Delay (decline in voice quality due to delay)
  - Variable delays (decline in voice quality due to jitter)
  - Packet loss (decline in voice quality due to packet loss)

Quality of Service includes various methods which guarantee certain transmission properties in packet-orientated networks (IP).

It is thus important, for example, to ensure a minimum bandwidth for Voice over IP for the entire duration of the transfer operation. When several equal-access applications are operating via IP, the available transmission link bandwidth (for example, an ISDN B channel, 64K bps) is shared between these applications. Consequently, packet loss may occur during a voice connection, causing poor voice quality.

HiPath 3000/5000 QoS

In HiPath 3000/5000 networks, different types of traffic are transported via a single IP infrastructure. It is the aim of Quality of Service to fulfill the data traffic and voice traffic requirements.

To prevent voice traffic from being suppressed by data traffic, the former must be given high priority. In addition, it must be specified that high-priority traffic is transmitted before traffic with lower priority. This is specified on layers 2 and 3:

- The three bits in the 802.1p field, which is part of the 802.1Q tag, are used on layer 2.
- On layer 3, the six bits in the DiffServ Code Point (DSCP) field are used in the IP headers' Type of Service (ToS) byte.

It is also essential that sufficient bandwidth is available within the QoS class in use (Codepoint/ IEEE802.1p User Priority). The following table lists the QoS values used for DiffServ and the User Priority IEEE802.1p field.

Table 13-2 Possible QoS Settings

Traffic type	**DiffServ Code Point**	**802.1p field** **(Priority 0 (= lowest) – 7 (= highest)**	**Traffic class**
Voice payload (RTP/RTCP)	AF12 (001100)	6	Guaranteed service
Data payload (fax gateway)	AF11 (001010)	6	Guaranteed service
Signaling (H.225, H.245 and real-time application signaling)	AF21 (010010)	5	Controlled Load
All other traffic types	DE (000000)	0	Best effort

Information on the QoS procedures used for HG 1500 can be found in the HG 1500 Administration Manual.

13.3 Network analysis

> Network analysis must be performed before installation of the relevant systems and applications to guarantee smooth operation in the customer network.
> Network analysis determines the conditions under which the customer's network is suitable for HiPath 3000/5000. The result report is an integral component of the requirement specifications in the HiPath 3000/5000 solution contract.

The Network Analysis service module is used to check whether the customer's communication network is suitable for business-over-IP solutions from Siemens AG (HiPath 3000, HiPath 4000, HiPath 5000, etc.). The assessment is carried out on the basis of parameters preset by the products. The customer receives a final report in which the network structure and operating parameters (percentage utilization, delay, jitter) are documented.

Information can be found on the HiPath Network Analysis home page: https://netinfo.icn.siemens.de/es/products/prod_netzwerk_analyse_v2/product/home_page.

Customer benefits and cost-effectiveness

- Preparation of the network for future applications (VoIP)
- Determination of current traffic volume and percentage utilization, baselining
- Decision-making assistance for the introduction of VoIP solutions

Network analysis performance specification

- Examination of the suitability of customer networks for Siemens AG Voice-over-IP solutions
- Recording of relevant parameters over a predefined test time
- Assessment on the basis of product specifications
- Interpretation of test results with suggestions of further measures
- Final report with recommendations

Configuration notes

For use when planning Siemens AG Voice-over-IP solutions

For use only in SNMP-based IP data networks (routers, IP switches, hubs)

A System Programming Codes (Expert Mode Codes)

Introduction

You can administer HiPath 3000 systems from an optiset E or optiPoint 500 telephone (with display) using expert mode at either of the first two stations ($U_{P0/E}$). You can initiate expert mode by entering a sequence of consecutive digits that branch you to the desired option.

Error message displays

You must acknowledge error messages. When the system reports an error as a result of entering a previously used code, the expert mode code appears at the beginning of the second line of the display. You can use the expert mode code to go directly to the desired menu segment.

Menu selection using codes

Depending on the menu you enter either single-digit or multi-digit codes. You can use "*" on the numeric keypad to change the item and "#" to invoke the configuration option.

Accessing system administration

Users can access system administration by entering a user name (ID) and password (authentication). Depending on the active password concept (refer to Section 12.6.1.1 for more details), the procedure is as follows:

Table A-1 Starting System Administration (Service)

Step	Entry	Description
1.	*95	Start system administration
2.	XXXXX	Enter user name: ● Fixed password concept: User name = 31994 ● Variable password concept: Individual user name
3.	XXXXX	Enter password: ● Fixed password concept: Password = 31994 ● Variable password concept: Individual password

For an example of the first time system administration is called via Assistant T after the system is booted, refer to Page 12-79.

Table A-2 Expert Mode Code Groups

Code Group	Function
System maintenance expert mode (previously Assistant T)	
11	Call detail recording
12	Speed dialing system
13	Account codes
14	Set up station
15	CO call privileges
16	Incoming calls
17	Networking
18	Traffic restriction
19	Displays
20	ISDN parameters
21	Analog CO interface
22	System settings
23	Code
24	Door relay
25	Announcement/Music
26	Relays
27	Sensors (HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300 only)
28	Edit CDB
29	System details
30	Remote service
31	Call distribution
32	Paging
33	Attendant
34	DISA
35	Least Cost Routing (LCR)
36	HiPath Cordless Office
37	Security
51 – 63	Customer administration (previously Assistant TC)

Table A-3 Expert Mode Codes

Code				Function
11				**Call detail recording**
11	1			CDR/station (call detail recording at station)
11	1	1		View CDR/station; enter station number
11	1	2		Print CDRS
11	2			CDR per trunk (call detail recording per trunk)
11	2	1		View CDR per trunk; select slot/trunk
11	2	2		Print CDRT
11	3			CDR central (call detail recording central)
11	3	1		Output format: 0 = compressed, 1 = long
11	3	2		Station number format, suppress digits: 0 = no, 1 = yes
11	3	3		Incoming calls: 0 = no, 1 = yes
11	3	4		Call duration 0 = no, 1 = yes
11	3	5		Output MSN: 0 = no, 1 = yes
11	3	6		Call charge display: 1 = Amount, 2 = Pulses
11	3	7		Outgoing without connection: 0 = no, 1 = yes
11	4			Call charge factor Enter 0 % to 10000 %
11	5			ISDN factor Enter 0 % to 10000 %
11	6			Currency, alphanumeric entry of max. 3 characters (not for U.S.)
11	7			Call log: 0 = no, 1 = yes
11	8			CDRA (call detail recording, attendant), pay phone, station.
11	9			Computing accuracy, decimal digits (0 to 3)
12				**Speed dialing system**
12	1			Speed dial numbers, external station numbers 000 to 999 (HiPath 3750, HiPath 3550, HiPath 3700, HiPath 3500); 000 to 299 (HiPath 3350, HiPath 3300)
12	2			Speed dial names, alphanumeric entries of up to 16 characters (optiset E memory and optiPoint 600 office only), only if speed-dialing numbers have been entered.

Table A-3 Expert Mode Codes

Code				Function
13				**Account Code (ACCT)**
13	1			Code entries, list 0 to 999
13	2			Checking procedure 0 = Not checked, 1 = Acc. code list, 2 = Number of digits
13	3			Entry procedure 0 = Optional, 1 = Mandatory
13	4			Code length (1 to 11)
14				**Set up station**
14	10			Copy station data
14	11			Station type
14	11	0		Standard
14	11	1		Fax
14	11	2		PhoneMail (5 digits)
14	11	3		Loudspeaker
14	11	4		Answer Machine
14	11	5		External MOH
14	11	6		P.O.T MW LED
14	11	7		PhoneMail (6 digits)
14	11	8		Door station with pulsed loop
14	11	9		Memo
14	11	10		Modem
14	12			Station name, alphanumeric entry of up to 16 characters (optiset E memory and optiPoint 600 office only)
14	13			Override: 0 = denied, 1 = allowed
14	14			Associated Dialing: 0 = denied, 1 = allowed
14	15			DISA: 0 = denied, 1 = allowed
14	16			Call waiting rejection: 0 = off, 1 = on
14	17			Headset 0 = off, 1 = on
14	18			Call pickup group: HiPath 3750/HiPath 3700: Groups 1 to 32, max. 32 stations HiPath 3550/HiPath 3500: Groups 1 to 16, max. 32 stations HiPath 3350/HiPath 3300: Groups 1 to 8, max. 8 stations
14	19			Reset station PIN: 0 = Reset to 00000

Table A-3 Expert Mode Codes

Code				Function
14	20			Override do not disturb 0 = no, 1 = yes
14	21			Missed Calls List: 0 = no, 1 = yes
14	22			MCID: 0 = denied, 1 = allowed
14	23			Call FWD, external: 0 = denied, 1 = allowed
14	24			Reserved
14	25			Data compression 0 = no, 1 = yes
14	26			Select language: 11 = German 12 = US English 13 = French 14 = Spanish 15 = English 16 = Italian 17 = Dutch 18 = Portuguese 19 = Finnish 20 = Czech 21 = Danish 22 = Swedish 23 = Norwegian 24 = Turkish 25 = Telekom, German 26 = Polish 27 = Hungarian 28 = Russian 29 = Greek 30 = Slovenian 31 = Serbo-Croatian 32 = Estonian 33 = Latvian 34 = Lithuanian 35 = Chinese 36 = Slovakian 37 = Catalonian
14	27			Do not Disturb: 0 = off, 1 = on
14	28			Telephone lock intercept: 0 = no, 1 = yes
14	29			Dialing method: 1 = DTMF, 2 = DP

Table A-3 Expert Mode Codes

Code				Function
14	30			optiPoint BLF (busy lamp field or BLF), Display: No BLF, one BLF, two BLFs
14	31			Ringback protection per station
14	32			Setup station in internal phonebook: 0 = no, 1 = yes
14	33			Edit tel. number 0 = no, 1 = yes
14	34			Monitoring: 0 = not authorized, 1 = authorized
14	35			Keypad dial: 0 = not authorized, 1 = authorized
14	36			Forwarding CFSS
15				**CO call privileges**
15	1			Direct trunk access day; specify reference station Enter new data: 0 = No trunk access except by system speed-dialing 1 = Incoming only 2-7 = Allowed list, Allowed list 1-6 8-13 = Denied list, Denied list 1-6 14 = Full access
15	2			Direct trunk access night; specify reference station Enter new data: 0 = No trunk access except by system speed-dialing 1 = Incoming only 2-7 = Allowed list, Allowed list 1-6 8-13 = Denied list, Denied list 1-6 14 = Full access
15	3			Allowed lists
15	3	1		Allowed list 1, 100 entries
15	3	2		Allowed 2, 10 entries
15	3	3		Allowed 3, 10 entries
15	3	4		Allowed 4, 10 entries
15	3	5		Allowed 5, 10 entries
15	3	6		Allowed 6, 10 entries
15	4			Denied lists
15	4	1		Denied list 1, 50 entries
15	4	2		Denied 2, 10 entries
15	4	3		Denied 3, 10 entries

Table A-3 Expert Mode Codes

Code				Function
15	4	4		Denied 4, 10 entries
15	4	5		Denied 5, 10 entries
15	4	6		Denied 6, 10 entries
15	5			Number of authorized stations (for verification purposes only)
15	6			Lock Code 0 = No trunk access except by system speed-dialing 1 = Incoming only 2 - 7 = Allowed lists 1-6 (AL 1 to AL 6) 8 - 13 = Denied lists 1-6 (DL 1 to DL 6) 14 = Full access (full)
15	7			Toll restriction, 0 = Digit-by-digit, 1= En-bloc sending
15	8			Switched trunk authorization
15	9			Toll restriction, private
16				**Incoming calls**
16	10			Internal station numbers
16	10	1		Station
16	10	1	1	Boards
16	10	1	2	Change station number
16	10	1	3	Find station number
16	10	2		Groups
16	11			DID numbers; (internal) station number is displayed; enter (new) station number
16	12			Intercept position, day; enter new destination, group or Stn. no., max. 6 digits
16	13			Intercept position, night; enter new destination, group or Stn. no., max. 6 digits
16	14			Intercept criteria
16	14	1		on RNA: 0 = no, 1 = yes
16	14	2		on Busy
16	14	2	1	Intercept 0 = no, 1 = yes
16	14	2	2	Call waiting on busy: 0 = no, 1 = yes
16	14	3		on Invalid, intercept: 0 = no, 1 = yes

Table A-3 Expert Mode Codes

Code				Function
16	14	4		on Incomplete, intercept: 0 = no, 1 = yes
16	14	5		on Automatic recall, intercept: 0 = no, 1 = yes
16	15			Hunt/group call
16	15	1		Called station no.; select group and assign destination
16	15	2		Ring type; select group and type: 1 = Circular hunt group 2 = Linear hunt group 3 = Group call 4 = Group call, no answer 5 = Basic MULAP 6 = Executive MULAP 7 = Group call, call waiting
16	15	3		Group name; select group and enter name (only optiset E memory and optiPoint 600 office)
16	15	4		Select host (master)/executive, group, and station (only stations that are not the host (master) telephone in another group)
16	16			Call allocation, day; select slot/trunk and assign station no.
16	17			Call allocation, night; select slot/trunk and assign station no.
16	18			Call forwarding—no answer
16	18	1		Select call destination list and destination index (1 – 4). Call destination lists: ● up to and including V1.2 = 70 ● V3.0 or later = – 500 for HiPath 3750, HiPath 3700 – 376 for HiPath 3550, HiPath 3500 – 70 for all other systems Select destination (1 – 4), possible entries: ● targeted call number of a station or a group ● * = identical to called station ● #9 = system search of all stations except for the executive extensions ● #201 – #260 = uniform call distribution group 01 to group 60 ● #301 – #316 = announcement device 01 to 16 ● an external destination, in other words call numbers in satellites and in the central office

Table A-3 Expert Mode Codes

Code				Function
16	18	2		Internal calls; select station/group: ● up to and including V1.2 = 70 ● V3.0 or later = – 1 – 500 for HiPath 3750, HiPath 3700 – 1 – 376 for HiPath 3550, HiPath 3500 – 1 – 70 for all other systems
16	18	3		External calls, day; select station/group: ● up to and including V1.2 = 1 – 70 ● V3.0 or later = – 1 – 500 for HiPath 3750, HiPath 3700 – 1 – 376 for HiPath 3550, HiPath 3500 – 1 – 70 for all other systems
16	18	4		External calls, night; select station/group: ● up to and including V1.2 = 1 – 70 ● V3.0 or later = – 1 – 500 for HiPath 3750, HiPath 3700 – 1 – 376 for HiPath 3550, HiPath 3500 – 1 – 70 for all other systems
16	18	5		Number of rings (1 to 15) for station/group
16	18	6		Night bell, location for station/group
16	18	7		Night bell, mode: 1 = Immediate connect, 2 = After timeout
16	18	8		Call forwarding (CF) on busy, 0 = Do not forward call, 1 = Forward call
16	19			Ring cadence: 0 = Ring type 1, 1 = Ring type 2, 2 = Ring type 3
16	20			DTMF DID: 0 = denied, 1 = allowed
16	21			Ringback protection (Brazil): 0 = off, 1 = on
17				**Networking**
17	11			Simplified dialing: 0 = Off, 1 = On
17	12			Assign trunk group; select slot/trunk and assign trunk group Route 1-8 (HiPath 3350, HiPath 3300) Route 1-16 (HiPath 3750, HiPath 3550, HiPath 3700, HiPath 3500)
17	13			Overflow route; select route and assign overflow route
17	14			Trunk type CO/CS; select trunk type: 0 = CO, 1 = CS
17	15			Route name; select route and enter name (optiset E memory and optiPoint 600 office only)
17	16			Route seizure; Route selection: 0=cyclic, 1= linear

Table A-3 Expert Mode Codes

Code				Function
17	17			Rerouting (optimized B channel utilization)
17	17	1		Route optimize active: 0 = No, 1 = If route is known, 2 = Always
17	17	2		Change route: 0 = denied, 1 = allowed
17	18			Central intercept
17	19			Call data routing
17	19	1		Destination system
17	20			Digit repetition; select trunk group: 0 = off, 1 = on
17	21			Path optimization: 0 = no, 1 = yes
17	22			QSig: Voice mail
17	22	1		Callback access number
17	22	2		Callback access name
17	23			QSig: Busy signaling
17	23	1		Stations: 0 = no, 1 = yes
17	23	2		Station number, destination system
17	23	3		System number, destination system
17	24			Station number type: 1 = Internal, 2 = DID, 3 = Internal/DID
18				**Traffic restriction**
18	1			Configure exec./sec. groups; select group, enter: 1 = Exec. 1, 2 = Exec. 2, 3 = Sec. 1, 4 = Sec. 2 HiPath 3750/HiPath 3700: Group 1-16 HiPath 3550/HiPath 3500: Group 1-10 HiPath 3350/HiPath 3300: Group 1-4
18	2			Hotline
18	2	1		Hotline destinations HiPath 3750, HiPath 3550, HiPath 3700, HiPath 3500: Destination 1-6 HiPath 3350/HiPath 3300: Destination 1
18	2	2		Hotline station number
18	2	2	1	Hotline Mode: 0 = Off, 1 = Hotline, 2 = Off-hook alarm after timeout
18	2	2	2	Hotline assignment HiPath 3750/HiPath 3550/HiPath 3700/HiPath 3500 1-6 HiPath 3350/HiPath 3300 1
18	2	3		Hotline timeout, 1-99 x s

Table A-3 Expert Mode Codes

Code				Function
18	3			ITR groups (internal traffic restriction groups)
18	3	1		Group assignment
18	3	1	1	Station (Group 1-6)
18	3	1	2	Trunks; select slot and trunk (Group 1-6)
18	3	1	3	Speed-dialing number assignment
18	3	1	3 - 1	Minimum speed-dialing group, Select group, 0 to 999
18	3	1	3 - 2	Maximum speed-dialing group, Select group, 0 to 999
18	3	2		Connection groups
18	3	2	1	Matrix, Select Group: 0 = no, 1 = yes
19				**Displays**
19	11			Text messages: select message no. 0 to 9 and enter alphanumeric text (up to 24 characters) (optiset E memory and optiPoint 600 office only)
19	12			Advisory messages: select message no. 0 to 9 and enter alphanumeric text (up to 24 characters) (optiset E memory and optiPoint 600 office only)
19	13			Enter 4-digit time in the format HHMM (hour minute)
19	14			Enter 6-digit date in the format DDMMYY (day month year)
19	15			Call duration: 0 = off, 1 = on
19	16			Name, Call numbers: 0 = Calling ID only, 1 = Name, 2 = Name and calling ID
19	17			Automatic recall 1 = Caller, 2 = Transferred destination
19	18			Transfer before answer: 1 = Transferred by, 2 = Transferred to
20				**ISDN parameters**
20	1			Call number suppression 0 = off, 1 = on
20	2			System station number - incoming
20	2	1		Station number; select trunk group
20	2	2		National number; select trunk group
20	2	3		International number; select trunk group
20	2	4		Type, outgoing; select trunk group: 0 = Unknown, 1 = Station, 2 = National, 3 = International, 4 = Internal
20	2	5		National prefix (U.S. = 1)
20	2	6		International prefix (U.S. = 011)

Table A-3 Expert Mode Codes

Code				Function
20	3			Reference clock
20	3	1		Allowed nos. list; select position (slot and port)
20	3	2		Denied nos. list; select position (slot and port)
20	4			EU parameters (not for U.S.)
20	4	1		S_0 port configuration; select slot/port and determine connection type (not for U.S.): 1 = Automatic 2 = Euro CO PP 3 = Euro CO PMP 4 = Euro bus 5 = CorNet 1 6 = CorNet 2 7 = ECMA-QSIG 8 = ISO-QSIG
20	4	2		S2M port configuration; select slot/port and determine connection type (not for U.S.): 1 = Euro CO PP 2 = CorNet 1 3 = CorNet 2 4 = ECMA-QSIG 5 = ISO-QSIG
20	4	3		S_0 bus MSN (for verification purposes only)
20	4	4		Call forwarding PMP
20	4	4	1	Multiple subscriber numbers, select index, 1 to 10
20	4	4	2	MSN trunks, select index, 1 to 10
20	5			US parameters (for U.S. only)
20	5	1		BRI parameter
20	5	1	1	CO/protocol: 1 = AT&T/NI 1 2 = AT&T/Custom 3 = Siemens/NI 1 4 = NT/NI 1
20	5	1	2	SPID admin, select station, select slot/port
20	5	1	3	CAID admin, stn., select CAID
20	5	1	4	PDID admin, stn., select PDID

Table A-3 Expert Mode Codes

Code				Function
20	5	1	5	FIN - for message waiting
20	5	1	6	CACH EKTS, select slot/port: 0 = off, 1 = on
20	5	2		PRI parameters
20	5	2	11	Protocol type: 11 = AT&T/Custom 12 = AT&T/NI2 13 = AT&T/NI2 OSA 14 = AT&T/4ESS 15 = Siemens/Custom 16 = Siemens/Custom OSA 17 = Siemens/NI2 18 = Siemens/NI2 OSA 19 = MCI/DEX600 20 = MCI/DMS250 21 = BELL/DMS100 22 = BELL DMS100 TNS 23 = Nortel/DMS100 24 = Nortel DMS100 TNS 25 = SPRINT/DMS250 26 = Westinghouse 27 = FTS/DMS250 28 = FTS/5ESS 29 = GENERIC/NI2 30 = GENERIC/NI2 OSA 31 = QSIG 32 = IDA-P
20	5	2	12	Frame/line/encod, select slot 0 = ESF/B8ZS/Normal 1 = SF/ZCS/Inverted
20	5	2	13	Inwats parameter
20	5	2	13 - 1	Route
20	5	2	13 - 2	DNIS
20	5	2	13 - 3	Entrance telephone ring destination

Table A-3 Expert Mode Codes

Code				Function
20	5	2	14	Calling service, select trunk group 11 = NONE 12 = AT&TSDN-GSDN 13 = AT&TSDDN 14 = MCI-VN-VS 15 = SPRINT-VPN 16 = WICN-PV 17 = MEG800-TFM 18 = MCI 800 19 = ULTRA-800 20 = WICN-INWATS 21 = MEG 22 = MCI-PRISIM-WATS 23 = SPR-ULTRA-WATS 24 = WICN-OUTWATS 25 = ACCU-SDS 26 = LDS-WC-TSAA 27 = INTER-800 28 = MULTIQUEST 29 = MCI-900 30 = SDS56 31 = SDS64C 32 = SDS64R 33 = DMS100-PV 34 = DMS100-INWATS 35 = DMS100-OUTWATS 36 = DMS100-FX 37 = 5ESS-INWATS 38 = WATS-MSB 39 = DMS100-TIE 40 = NI2-INWATS 41 = NI2-OUTWATS 42 = NI2-FX 43 = NI2-TIE 44 = NI2-HOTEL 45 = NI2-SCOCS 46 = CALL-BY-CALL 1 47 = CALL-BY-CALL 2 48 = CALL-BY-CALL 3 49 = CALL-BY-CALL 4 50 = WATS-BANDED

Table A-3 Expert Mode Codes

Code				Function
20	5	2	15	CBC pool: 11 = AT&TSDN-GSDN 12 = AT&TSDDN 13 = MCI-VN-VS 14 = SPRINT-VPN 15 = WICN-PV 16 = MEG800-TFM 17 = MCI 800 18 = ULTRA-800 19 = WICN-INWATS 20 = MEG 21 = MCI-PRISIM-WATS 22 = SPR-ULTRA-WATS 23 = WICN-OUTWATS 24 = ACCU-SDS 25 = LDS-WC-TSAA 26 = INTER-800 27 = MULTIQUEST 28 = MCI-900 29 = SDS56 30 = SDS64C 31 = SDS64R 32 = DMS100-PV 33 = DMS100-INWATS 34 = DMS100-OUTWATS 35 = DMS100-FX 36 = 5ESS-INWATS 37 = WATS-MSB 38 = DMS100-TIE 39 = NI2-INWATS 40 = NI2-OUTWATS 41 = NI2-FX 42 = NI2-TIE 43 = NI2-HOTEL 44 = NI2-SCOCS
20	5	2	16	CBC access code
20	5	3		S0 bus MSN, select slot/port
20	5	4		QSig: S0 parameter
20	6			QSIG parameter

Table A-3 Expert Mode Codes

Code				Function
20	6	1		System number
20	6	2		Group number
20	7			Keypad dial: 0 = denied, 1 = allowed
20	8			System station number - outgoing
20	8	1		Port number
20	8	2		National number
20	8	3		International number
20	8	4		Suppress station number
21				**Analog CO interface**
21	1			Dialing method; select slot/trunk: 0 = Automatic, 1 = DTMF, 2 = Dial pulses 3 = MFC-R2, 4 = MFC-R2 with OAD
21	2			Delayed dialing; select trunk group: 0 = No pause, 1 = 1 s, 2 = 3 s, 3 = 6 s, 4 = 9 s
21	3			Trunk call pause; select trunk group: 1 = 6 s, 2 = 13 s
21	4			Line Length; select slot and trunk: 0 = Short 1 = Long
21	5			Charge data module, select slot/trunk: 0 = off, 1 = on
21	6			Silent reversal: 0 = no, 1 = yes
21	7			Port status: 0 = on, 1 = Off (SW), 2 = Off (HW), 3 = Off (HW, SW)
22				**System settings**
22	11			Music on Hold (MOH): 0= Off, 1 = No ring tone, 2 = Ring tone, 3 = Announcement device 1
22	12			Internal Phonebook: 0 = No, 1 = Internal, 2 = LDAP, 3 = All
22	13			V.24 (RS-232) configuration
22	13	1		Select CB baud rate: 1 = 9600 baud, 2 = 2400 baud, 3 = 19200 baud
22	13	2		Port assignment
22	13	2	1	CSTA/CDRC (call detail recording central), output: 0 = none, 1 = V.24 port, 2 = UPN port, 3 = PC-VPL, 4 = LAN
22	13	2	2	Port for CDRS (call detail recording at station), output: 0 = none, 1 = V.24 port, 2 = UPN port

Table A-3 Expert Mode Codes

Code				Function
22	13	2	3	Port for CDRT (call detail recording per trunk), output: 0 = none, 1 = V.24 port, 2 = UPN port
22	13	2	4	Port for CDB printout
22	13	2	5	Port for CDR printout
22	13	2	6	Port for CDRA (call detail recording, attendant); if a pay phone is configured, also see code 11 8), output: 0 = none, 1 = V.24 port, 2 = UPN port
22	14			Call FWD, external
22	14	1		Connect call: 0 = On answer, 1 = Immediately.
22	14	2		Call forwarding: 0 = deactivate, 1 = activate
22	15			Caller list mode: 1 = Only external, 2 = External and Internal, 3 = External ring/call
22	16			Applications
22	16	1		Call distribution: 0 = no, 1 = yes
22	17			Tones
22	17	1		Conference, Warning tone: 0 = off, 1 = on
22	17	2		Call pickup, Warning tone: 0 = off, 1 = on
22	18			Transfer key (Retrieve): 1 = Press once, 2 = Press twice
22	19			Class of service
22	19	1		Night answer, Pos. 1-5; enter station
22	19	2		Central telephone lock
22	20			DTMF automatic: 0= no, 1 = yes
22	21			Key click: 0=Off, 1= Volume 1 ... 4 = Volume 4
22	22			DTMF - Pulse/Pause: 1 = 70/70 msec, 2 = 80/80 msec, 3 = 80/250 msec, 4 = 200/200 msec
22	23			Phone lock destination
22	24			Stn. relocate: 0 = denied, 1 = allowed
22	25			Trunk reservation: 0 = off, 1 = on
22	26			Speaking volume: 0 = default, 1 = high
22	27			CO features (Transfer/Conference/Drop): 0 = disabled, 1 = enabled
22	28			Feature Identification Number (FIN) for Transfer (U.S. only)
22	29			Feature Identification Number (FIN) for Conference (U.S. only)

Table A-3 Expert Mode Codes

Code				Function
22	30			Feature Identification Number (FIN) for Drop (U.S. only)
22	31			MSN default (for U.S. only): 0 = off, 1 = on
22	32			DTMF hidden: 0 = off, 1 = on
22	33			Announcement with connection: 0 = denied, 1 = allowed
22	34			MFC-R2 parameters
22	34	1		Ringback protection
22	34	2		DID digits
22	35			Common hold
22	35	1		By hanging up
22	35	2		Without hanging up
22	36			Switch line, DSS: 0 = no, 1 = yes (Status 1 = U.S., Status 0 = Rest of World (ROW)
22	37			Advisory call 0 = off, 1 = on
22	38			Trace stop facility
22	38	1		Stop trace
22	38	1	01	Assistant: 0 = inactive, 1 = active
22	38	1	09	HW: 0 = inactive, 1 = active
22	38	1	12	Processor: 0 = inactive, 1 = active
22	38	1	15	APSXF: 0 = inactive, 1 = active
22	38	1	16	General: 0 = inactive, 1 = active (error 19 cannot be set to inactive)
22	38	1	20	CP: 0 = inactive, 1 = active
22	38	1	21	DH: 0 = inactive, 1 = active
22	38	1	23	Network: 0 = inactive, 1 = active
22	38	1	26	Presence 0 = inactive, 1 = active
22	38	1	28	Recovery: 0 = inactive, 1 = active
22	38	1	29	IO Process: 0 = inactive, 1 = active
22	38	1	30	LW: 0 = inactive, 1 = active (0 to n)
22	38	1	11	LW date: 0 = inactive, 1 = active (41 to n)
22	38	2		Reset: 1 = Delete all/2 = System default
22	39			IP access

Table A-3 Expert Mode Codes

Code				Function
22	39	1		IP interface, mode: 0 = inactive 1 = HIP Forwarding 2 = LIM 3 = SLIP Routing
22	39	2		IP address, data (7 ... 15): x.x.x.x (x = 0 ... 255) Use either "*" or "." as a separator.
22	39	3		Subnet mask
22	39	4		Gateway IP address
22	40			Open numbering scheme
22	40	1		Active/inactive
22	40	2		Voice mail node number
22	40	3		Node number
22	41			UCD permanently available: 0 = inactive, 1 = active
23				**Code**
23	1			Substitute code *, code 75
23	2			Substitute code #, code 76
23	3			Trunk access code; select slot and trunk and enter new code
23	4			Route code; Select route followed by position 1-10 for code and enter new code Route 1-8 (HiPath 3350HiPath 3300,) Route 1-16 (HiPath 3750, HiPath 3550, HiPath 3700, HiPath 3500)
23	5			Attendant code
23	5	1		Attendant code DID
23	5	2		Attendant code internal
23	6			Second trunk access code
23	7			Reset telephone lock code
23	8			Hotel terminal
24				**Door relay**
24	1			Entrance phone; select door, max. 6 digits, door 1-4
24	2			Destination; select door, max. 6 digits, door 1-4
24	3			Door opener, select door: 0 = not available, 1 = available, 2 = available with DTMF, doors 1-4

Table A-3 Expert Mode Codes

Code				Function
24	4			Call forwarding, door, external; select door: 0 = deactivate, 1 = activate
24	5			Door opener, DTMF, select station: 0 = denied, 1 = allowed
25				**Announcement/Music**
25	1			Announcement devices
25	1	1		In system (select announcement device 1 ... 16)
25	1	2		Via server (select announcement device 1 ... 16)
25	2			Type of ann., select ann. device: 1 = Ann. type, 2 = Music on hold, 3 = Internal music
25	3			Announcement prior to answer; select slot and trunk
25	4			External MOH (Only enter analog line module stations.)
26				**Relays**
26	1			Type; select relay 1 to 4 and assign function: 11 = Manual on and off 12 = Off after timeout 13 = Door opener 14 = Speaker amplifier (starting contact for amplifier) 15 = Busy display 16 = Music on hold 17 = Call charge pulse 18 = Second bell 19 = Station active 20 = Announcement
26	2			Switching time Select relay 1 through 4 and enter up to 3 digits (0 to 255)
26	3			Assigned station Select relay 1 through 4 and enter stations or groups (up to 5 digits)
26	4			Relay name; select relay 1 through 4, enter alphanumeric name of max. 16 characters (optiset E memory and optiPoint 600 office only)
27				**Sensors (HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300 only)**
27	1			Type: 0 = Alarm, 1 = Call distribution
27	2			Destination station no.; select sensor 1 - 4 External station with seizure code (trunk/direction) Internal station with station prefix (if programmed)

Table A-3 Expert Mode Codes

Code				Function
27	3			Station no. for announ.; select sensor 1 - 4 and enter station or group number (max. 6 digits)
27	4			Infobox control data; select sensor 1 - 4 and enter control characters 0 - 9, *, #, max. 24 digits
27	5			Call duration; select sensor 1 through 4 and enter 1 to 255
27	6			Call pause; select sensor 1 through 4 and enter 0 to 255
27	7			Number of rings; select sensor 1 through 4 and enter 1 to 255
27	8			Block time; select sensor 1 through 4 and enter 0 to 255
27	9			Sensor text; select sensor 1 to 4, enter alphanumeric text of up 16 characters (optiset E memory and optiPoint 600 office only)
28				**Edit CDB (HiPath 3750/HiPath 3550/HiPath 3700/HiPath 3500 only)**
28	1			Print CDB data
28	2			Save CDB data
28	2	1		CDB to MMC
28	2	2		CDB from MMC
29				**System details**
29	1			System
29	1	1		System type (for verification purposes only)
29	1	2		SWversion (for verification purposes only)
29	2			Status Display
29	2	1		Call forwarding, external, 0 = Off, 1 = On (for verification purposes only)
29	2	2		Night service, 0 = Off, 1 = On (for verification purposes only)
29	2	3		Trunk, 0 = Inactive, 1 = Active (for verification purposes only)
29	2	4		Ping, 1 = IP address, 2 = Start
29	2	5		MAC address
29	3			Options (HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 only)
29	3	1		Type per option (for review only) 1 = Relays 2 = Call detail recording 3 = Fax/DID 4 = ANI 5 = Announcement (Beyer)

Table A-3 Expert Mode Codes

Code				Function
29	3	2		Software version for each option (1 to 16) (for verification purposes only)
29	3	3		Reset options
29	4			Boards
29	4	1		Board type, select slot: 11 = TMS2 12 = TMST1 - digital 13 = TIEL 14 = TMDID 15 = TML8W 16 = TMOM 17 = TMGL8 18 = TLA2 19 = TLA4 20 = TLA8 21 = TS2 22 = TMGL2 23 = TMGL4 24 = TMQ2 25 = TMQ4 26 = TST1 - digital 27 = STMD 28 = STLS2 29 = STLS4 30 = SLA16 31 = SLMO8 32 = SLMO24 33 = SLMC8 (CMI V1) 34 = 4SLA 35 = 8SLA

Table A-3 Expert Mode Codes

Code				Function
29	4	1		Board type, select slot: 36 = 16SLA 37 = SLU8 38 = ILAN 39 = SLC16 (CMI V2.2M) 42 = SLMO8K 43 = SLMO24K 44 = SLA8N 45 = SLA16N 46 = SLA24N 47 = TMAMF 48 = CR8 49 = SLU4 (Octopus E 10) 50 = SLU2 (Octopus E 10) 51 = HXGM (HiPath 3750, HiPath 3700) 52 = HXGS (HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300) 53 = IVMS8 54 = IVML8 55 = IVML24 56 = SLAS16 57 = TMCAS 58 = SLU8 ($U_{P0/E}$ interfaces on CBCC, CBRC, CBCP) 59 = SLU4 ($U_{P0/E}$ interfaces on SBSCO) 60 = SLU2 ($U_{P0/E}$ interfaces on SBSCS) 61 = 4SLAN 62 = 8SLAN 63 = 16SLAN 64 = HXGM3 65 = HXGS3 66 = SLC16N 67 = STMD2
29	4	2	xx	Reset board (for board no., see 29-4-1)
29	4	3	0 - 9	Board status
29	4	4		Lock/release card
29	5			Country initialization
29	5	1		Variable password
29	5	1	00 to 99	See Select country code

Table A-3 Expert Mode Codes

Code				Function
29	5	2		Fixed password
29	5	2	00 to 99	Select country code 11 = Germany 12 = Netherlands 13 = France 14 = Finland 15 = United Kingdom 16 = Italy 17 = Spain 18 = Portugal 19 = Switzerland 20 = Austria 21 = International 22 = Ireland 23 = Belgium 24 = Brazil 25 = South Africa 26 = China 28 = India 29 = Czech Republic 30 = Denmark 31 = Australia 32 = Argentina 33 = Philippines 35 = Brazil 2 36 = Singapore 37 = Hungary 38 = Malaysia 40 = Indonesia 41 = Russia 42 = Thailand 46 = Poland 47 = Greece 49 = Sweden 50 = Norway 51 = Turkey 52 = U.S. 53 = Pakistan 54 = Hong Kong 55 = New Zealand 56 = Taiwan

Table A-3 Expert Mode Codes

Code				Function
29	6			Virtual subscribers
29	6	1		Configure stations
29	6	2		Display stations
30				**Remote service**
30	1			DTMF access: 0 = No access, 1 = Access as host (primary), 2 = Access as client (secondary), 3 = Host and client (primary and secondary)
30	2			ISDN trunk access: 0 = Enable procedure, 1 = Logon (DID) without PIN, 2 = Logon (DID) with PIN, 3 = Callback
30	3			Other access: 0 = Enable procedure, 1 = Logon without code, 2 = Logon (DID) with code, 3 = Callback
30	4			Reset password
30	5			Integrated modem
30	5	1		Station number, remote service, max. 6 digits
30	5	2		DID number, remote service
30	5	3		CAID admin (for U.S. only)
30	6			Digital modem
30	6	1		Station number, remote service, max. 6 digits
30	6	2		DID number, remote service
30	6	3		CAID admin (for U.S. only)
30	7			Callback connection
30	7	1		Destination; select position (1-6)
30	7	2		Password; select position (1-6)
30	7	3		X.75 protocol: 0 = no, 1 = yes
30	8			Automatic customer database printout: 0 = no, 1 = yes
30	9			USBS D channel access
30	9	1		Station number, remote service
30	9	2		DID number, remote service
31				**Call distribution**
31	1			Group assignment; select group ID
31	2			Group parameters

Table A-3 Expert Mode Codes

Code				Function
31	2	1		Announcement device; select group HiPath 3750/HiPath 3700: Announcement device 1-16 HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300: Announcement device 1-4
31	2	2		Wait times; select group, time: 1-9 x 30s
31	2	3		Call cycles
31	2	3	1	Primary cycles; select group
31	2	3	2	Secondary cycles; select group
31	2	4		AICC connection; select group 0 = off, 1 = on
31	2	5		Max. waiting calls; select group
31	3			Wrap-up time 0 = no wrap-up time, 1-20 = wrap-up x 30s
31	4			Call priority external; select slot/trunk
31	5			Call priority internal
32				**Paging**
32	1			PSE port (slot and trunk)
32	2			Radio paging type (only HiPath 3750/HiPath 3700): 1 = standard, 2 = enhanced
32	3			Protocol: 1 = ESPA 4.4.5, 2 = ESPA 4.4.3
32	4			Operating mode
32	4	1		Mode urgent
32	4	2		Mode normal
32	4	3		Mode text
32	5			Display
32	5	1		Call number
32	5	1	1	Number of digits
32	5	1	2	Display, filler: 0=none, 1=left, 2=right
32	5	1	3	Filler
32	5	2		Text
32	5	2	1	Number of digits
32	5	2	2	Display, filler: 0=none, 1=left, 2=right
32	5	2	3	Filler

Table A-3 Expert Mode Codes

Code				Function
32	6			PSE data transfer; select sequence: 1 = Operating mode, 2 = Call no., 3 = Text
32	7			PSE dial assignment; select station (not for U.S.)
32	8			PSE dial numbers; select index
33				**Attendant**
33	1			Queued calls
33	2			Reserved
33	3			Speed extending: 0 = denied, 1 = allowed
33	4			Extend undialed lines: 0 = denied, 1 = allowed
34				**DISA**
34	1			Day/night. select slot / line: 0 = None, 1 = Only night, 2 = Only day, 3 = Day and night
34	2			DID number
34	3			Security mode: 0 = After timeout, 1 = After #
34	4			CAID admin (for U.S. only)
35				**Least cost routing (LCR) (optiset E memory and optiPoint 600 office only)**
35	1			LCR on or off: 0 = off, 1 = on
35	2			Digit transmission: 0 = Digit-by-digit, 1= En-bloc sending
35	3			Dial rule
35	3	1		Name; select line
35	3	2		Format; select line
35	3	3		Type; select line: 0 = undefined, 1 = main network supplier, 2 = 1-level, 3 = 2-level, 4 = CN, 5 = DICS, 6 = PRI
35	4			Authorization code; select index (1-16)
35	5			LCR - schedule
35	5	1		Time limit; select day index (1 = Monday to 7 = Sunday) and time format (hhmm)
35	5	2		Timezone; select day index (1 = Monday to 7 = Sunday) and time period 1-8
35	6			Class of service (1 to 15); select station
35	7			Route tables

Table A-3 Expert Mode Codes

Code				Function
35	7	1		Route; select table/line
35	7	2		Assign dial rule; select table/line
35	7	3		Min. authorization; select table/line
35	7	4		Assign timezone; select table/line
35	7	5		Warning, Select table/line: 1 = None, 2 = Display, 3 = Tone, 4 = Display and Tone
35	8			Dial plan
35	8	1		Dialed digits; select line
35	8	2		Assign route table; select line
35	8	3		Account Codes: 0 = no, 1 = yes
35	8	4		CO call privileges, personal calls: 0 = no, 1 = yes
35	8	5		Toll restriction: 0 = no, 1 = yes
36				**HiPath Cordless Office**
36	1			Log on CMI unit; select device: 1 = inactive
36	2			CMI code; select device
36	3			CMI number; select device, changes not possible
36	4			Reset cordless code
36	5			DECT identification, data: 1. E/ARC 2. EIC 3. FPN 4. FPS
37				**Security**
37	1			Change password

Table A-3 Expert Mode Codes

Code				Function
				Customer administration (previously Assistant TC)
51				Speed dialing system
51	1			Speed-dialing numbers
51	2			Speed-dialing names
52				Time, hour/minute
53				Date, ddmmyy
54				Call detail recording (does not appear if another station has call detail recording authorization)
54	1			CDR at station
54	1	1		Edit CDRS
54	1	2		Print CDRS
54	2			CDR per trunk
54	2	1		Edit CDRT
54	2	2		Print CDRT
54	4			Call charge factor
54	5			ISDN factor
54	**6**			**Currency designation**
54	7			Call log
54	8			CDRA pay phone
55				**Station name**
56				**Text messages**
57				**Advisory messages**
58				Select language
59				**Group names**
60				Account codes
60	1			Account code list
60	2			Checking procedure, 0 = Not checked, 1 = ACCT list, 2 = Number of digits
60	3			Entry procedure, 0 = Optional, 1 = Mandatory
60	4			Number of digits

Table A-3 Expert Mode Codes

Code				Function
61				Hotline
61	1			Hotline destinations
61	2			Hotline station
61	2	1		Hotline mode, 0 = Off, 1 = Hotline, 2 = Code blue
61	2	2		Hotline assignment
61	3			Hotline timeout
62				Codes, remote service
63				Codes, Cordless
99				Access
The “bolded” messages appear in optiset E memory and optiPoint 600 office telephones only.				

B Codes for Activating/Deactivating Features

This appendix describes the options for activating and deactivating features depending on the different workpoint clients (WpC).

Table B-1	contains all the activation/deactivation procedures for analog workpoint clients, TDM workpoint clients without a display and CMI mobile phones. The table only contains the access codes for TDM workpoint clients with a display, CMI feature mobile phones and IP workpoint clients. The procedures for S_0 workpoint clients either correspond to procedures for analog workpoint clients or are handled via the relevant ISDN protocol with the terminal-specific user interface. The table also contains information about the effect of the telephone lock and the status-specific locking of features.
Table B-2	contains a description of the various types of workpoint clients.

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Activate relay	*90+Relay no.	7590...	*90...	–	V, T	–	H	–	–	A	X	RK, BS	
Deactivate relay	#90+Relay no.	7690...	#90...	–	V, T	–	H	–	–	A	X	RK, BS	
Accept call waiting (camp-on)	*55	Call waiting (local S_0 WpC functionality)	*55	–	V	BR, WA, RG, GS, BS	U	Mouse click, Drag& Drop	Mouse click	A	–	–	Also possible via the DSS, GESP, LTG or MUSAP key

Abbreviations:
- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Silent call waiting (camp-on) on	–	—	*87	–	V, T	RH	U1	Local feature	Local feature	D	X	RK, BS	
Silent call waiting (camp-on) off	–	–	#87	–	V, T	RH	U1	Local feature	Local feature	D	X	RK, BS	
Logon mode (for handset)	*942+Code +Stn. no.	–	*942	–	–	–	H	–	–	D,C,	X		
Query caller list	–	–	#82...	–	V	RH, BR	U	Local feature menu	Local feature menu	D	X		Only if enabled
Missed calls - save number/ save call number	–	–	*82	–	–	RG, GS	–	Local active menu	Local active menu	D	X	RK, BR, WA	Only if enabled
Do not disturb on	*97	7597	*97	–	V, T	RH	U	Feature key	Feature key	A	X	RK, BS	
Do not disturb off	#97	7697	#97	–	V, T	RH	U	Feature key	Feature key	A	X	RK, BS	
Call forwarding on, internal or external	*1+Type+Stn. no.	751... or Call forwarding (local S_0 WpC functionality)	*1...	–	V, U, T	RH	U	Feature key	Feature key	A	X	RK, BS	Later selection of the forwarding type: 1 = All calls, 2 = Ex. calls only, 3 = Int. calls only
Call forwarding off	#1	761	#1	–	V, T	RH	U1	Feature key	Feature key	A	X	RK, BS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easy-Com	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Call forwarding in EDSS1 trunk on (not for tenant service)	–	–	*64...	–	V, U, T	RH	U1	–	–	A	X	RK, BS	Only for S_0 trunk connection and authorized stations. Later selection of the forwarding type: 1 = immediate, 2 = unanswered calls, 3 = on busy. All call forwarding types can be activated independently of each other.
Call forwarding in EDSS1 trunk off (not for tenant service)	–	–	#64...	–	V, T	RH	U1	–	–	A	X		
CFSS (Call forwarding station out of service)	–	–	*9411	–	V, U, T	–	U1	–	–	I	X	RK, BS	CFSS (call forwarding station out of service) has higher priority than normal call forwarding.
CFSS (Call forwarding station out of service)	–	–	#9411	–	V, T	–	U1	–	–	I	X		
Call forwarding on for each MULAP	*501+MULAP+Type+Stn. no.	75501	*501	–	V, T	–	H	–	–	A			Only for MULAP members
Call forwarding off for each MULAP	#501+MULAP	76501	#501		V, T	–	H	–	–	A			Only for MULAP members
UCD (uniform call distribution), logon	*401+ID	–	*401..	–	V, U, T	–	U2	Feature key	Feature key	D, E, N,	X	RK, BS	Only for UCD group members

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
UCD (uniform call distribution), logoff	#401	–	#401	–	V, T	–	U2	–	Feature key	D, E, N	X	RK, BS	Only for logged on stations
UCD, available	*402	–	*402	–	V, T	–	U2	–	Feature key	D, E, N	X	RK, BS	Only for logged on stations
UCD, unavailable	#402	–	#402	–	V, T	–	U2	–	Feature key	D, E, N	X	RK, BS	Only for logged on stations
UCD, rework on	*403	–	*403	–	V, T	–	U2	–	Feature key	D, E, N	X	RK, BS	Only for logged on stations
Call distribution, rework off	#403	–	#403	–	V, T	–	U2	–	Feature key	D, E, N	X	RK, BS	Only for logged on stations
Call distribution, night destination on	*404 +* or Stn. no.	–	*404 ...	–	V, U, T	–	U2	–	Feature key	D, E, N	X	RK, BS	Only for logged on stations
Call distribution, night destination off	#404	–	#404	–	V, T	–	U2	–	Feature key	D, E, N	X	RK, BS	Only for logged on stations
Call distribution, queue	–	–	*405	–	V	–	U2	–	Call distribution menu	D	X	RK, BS	Only for logged on stations
Call acceptance	–	–	–	–	V	–	–	Mouse click, Drag& Drop	Local feature menu, Key	A	X	RH, BR, WA, BS, RG	Can only be activated using key
Advisory message on	–	–	*69...	–	V, U, T	RH	U1	Local feature menu	Local feature menu	D	X	RK, BS	
Advisory message off	–	–	#69...	–	V, T	RH	U1	Local feature menu	Local feature menu	D, C	X	RK, BS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Associated dialing	*67+Stn.+Stn. no.	7567...	*67...	–	U	–	H	–	–	A	X		Only for authorized stations
Associated services	*83+Stn.+ Services procedure...	7583	*83...	–	U	–	H	–	–	A	X	RK, BS	Only for authorized stations
Override	*62	–	*62	–	V	RG	U1	–	Local menu	D, E, N, C	–	–	Only for authorized stations
Automatic redial on	–	–	–	–	–	RG, GS (external)	–	–	–	D	X	–	Only for workpoint clients with display and with speakerphone or loudspeaker
Automatic redial off	–	–	–	–	–	RH	–	–	–	D	X	–	Only for workpoint clients with display and with speakerphone or loudspeaker
Room monitor on	*88	–	*88	–	V	–	H	–	–	D, E, N	X	WA, RG, GS,RK,BS	Not possible for workpoint clients without a speakerphone when handset is on-hook
Room monitor off	–	–	–	–	–	–	–	–	–	D, E, N	–		Room monitor off by hanging up or pressing the loudspeaker or release key
Telephone lock on, individual	*66+Code	7566...	*66...	–	U, T	RH	U1	Feature key	Feature key	A	–	RK, BS	
Telephone lock off, individual	#66+Code	7666...	#66...	–	U, T	RH, BR	U1	Feature key	Feature key	A	–	RK, BS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Change telephone lock access code	*93+Old code+2 x New code	7593...	*93...	–	–	–	H	Local feature menu	Local feature menu	A	X	RK, BS	
Reset services/features for own workpoint client	#0	760	#0	–	–	–	H	–	Feature key	A	x	RK, BS	See feature description: Reset activated features
Speaker calls	*80+Stn. no.	7580	*80	–	V, U	–	H	Menu	Feature key	A	–	RK, BS. WA, RG	Speaker calls to a group: Paging only possible if “Speaker call” has been enabled for the called party. The called party’s microphone is activated if “Direct Answering” has been enabled for this party (not for paging). Not possible with TDM WpC without a display or for analog and IP WpC.
Hands free answerback on	–	–	*96	–	V, T	RH	U1	–	–	D	X	–	Only for WpC with speakerphone
Hands free answerback off	–	–	#96	–	V, T	RH	U1	–	–	D	X	–	Only for WpC with speakerphone
Direct station selection (DSS)	–	–	–	–	V	–	–	–	–	D	–	–	Only for executive/secretary configuration

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Sup-ported work-point clients (see abbre-via-tions in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog work-point clients[1]	S_0 work-point cli-ents	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiCli-ent 130 V5.0 easy-Com	optiCli-ent 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
DISA (Direct Inward System Access)	–	–	–	–	–	–	–	–	–	–	–	–	Activation only possible from ex-ternal location for authorized sta-tions/lines
DISA internal	*47+DISA stn. no.+DISA STN.+service +Suffix dialing	–	*47...	–	V, U	RH	U1	–	–	D, E, N	X	WR, RG,RK,BS	Within a HiPath 5000 network only. Features cannot be activated from analog (DP) or S_0 WpC.
ENB (note-book function)	–	–	–	X	–	–	–	–	Local feature	D	X	–	Only for enhanced workpoint clients
Terminal identification	–	–	–	–	–	–	–	Possi-ble via central data-base	Possi-ble via central data-base	C	–	–	Performed auto-matically following line seizure from the idle state
Relocate: Save configu-ration	*9419 (only TDM WpC without display)	–	*9419	–	–	–	–	Possi-ble via central data-base	Possi-ble via central data-base	D, E	X	WR, RG, RK, BS, GS	
Relocate: Re-activation, load configura-tion	#9419 (only TDM WpC without display)	–	#9419	–	–	–	–	–	–	D, E	X	WR, RG, RK, BS, GS	
Terminal test	*940	–	*940	–	–	–	U1	–	–	D, E	–	WR, RG, RK, BS, GS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Sup-ported work-point clients (see abbre-via-tions in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog work-point clients[1]	S_0 work-point cli-ents	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiCli-ent 130 V5.0 easy-Com	optiCli-ent 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
MCID	*84	MCID (local S_0 WpC function-ality)	*84	–	V	–	H	–	–	A	–	–	
Flex call	*505+Stn. no.	75508	*508	–	V	–	H	–	–			—	
Emergency Trunk Access	*43+Trunk code	7543...	*43..	–	U	–	H	–	–	A	X	RK, BS	Only for attendant
View call charges (see charge dis-play)													
Call detail re-cording, atten-dant (CDRA)	–	–	–	–	V	–	–	–	–	D	x	RK, BS	Only if appropriate authorization is as-signed
Selective line seizure	See numbering plan	See number-ing plan	See num-ber-ing plan	–	V	–	–	See num-bering plan	See num-bering plan	A	X	–	Only with trunk key for prime line Telephone lock for outgoing lines only
Group call	See numbering plan	See number-ing plan	See num-ber-ing plan	–	V	–	–	See num-bering plan	See num-bering plan	A	–	–	Group calls can be programmed on DSS key
Group call, join	*85	7585	*85	–	V, T	RH	U1	Fea-ture menu	Fea-ture menu	A	X	RK, BS	All group calls, join = *85*
Group call, leave	#85	7685	#85	–	V, T	RH	U1	Fea-ture menu	Fea-ture menu	A	X	RK, BS	All group calls, leave = #85#

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Hold key	–	–	–	–	V	–	–	Mouse click, Key	Local active menu	D, E	–	–	
Hardware settings	+/– ...(local procedure for CMI)	–	+/–...	X	–	–	–	Local Key	Local Key	D, E, C	–	RK	From idle state: Call parameters, speaker mode (if available) From talk state: Volume
Host controlled station display	–	–	–	–	–	–	–	–	–	–	–	–	Only for workpoint clients with display. Text is sent by the application.
Hotel terminal	*491+Stn. no.	75491	*491	–	–	–	H	–	–	A	X	WA, RK, BS, RG	Activate LED
Hotline	–	–	–	–	–	–	–	–	–	A	–	–	Hotline destination is defined for each individual station in the CDR.
Send message (message waiting)	*68+(Stn. no.)+Text no.	7568...	*68...	–	V, U	RH, RG	U1	Local feature menu	Local feature menu	A	X	RK, BS	Without dialing call number in ringing state
Read message (message waiting)	–	–	–	–	–	RH, BR, GS	–	Local feature menu	Local feature menu	D	X	RK, BS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	**Operating procedure for**									**Sup-ported work-point clients (see abbre-via-tions in Table B-2)**	**Locking of feature**		**Note**
	TDM workpoint clients without display, CMI mobile phones, analog work-point clients[1]	**S_0 work-point cli-ents**	**TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone**					**optiCli-ent 130 V5.0 easy-Com**	**optiCli-ent 130 V5.0 office**				
				Key		**Menu**							
	Code + procedure	**Code**	**Code**	**Fixed**	**Programmable bar**	**Dialog**	**Service**	**Code**	**Code**		**via lock code**	**Status locking on**	
Cancel/an-swer/display message (message waiting)	#68	7668	#68...	–	–	RH	U1	–	Local feature menu	A	X	RK, BS	Suffix dialing not permitted for D, S. Suffix dialing for E, N, C: 0 = delete all sent and received messages, 1 = de-lete all sent mes-sages, 2 = delete all received mes-sages, 3 = call sender.
Fax waiting message/an-swering ma-chine	Only TDM work-point clients with corre-sponding key	–	–	–	V	–	H	–	–	D, E	–	–	Feature deleted by pressing the key
Internal call	See numbering plan	See number-ing plan	See num-ber-ing plan	–	V	–	–	See num-bering plan	See num-bering plan	A	–	–	Internal call can be programmed on DSS key
Disconnect key	–	–	–	–	V	–	–	Block dialing with correc-tion op-tion	Block dialing with correc-tion op-tion	–	–	–	
Keypad	*503	–	X503	–	–	GS	–	Can be dis-played	–	D, C	—	–	
Three-party conference	–	3-PTY (local S_0 WpC function-ality)	–	–	–	GS	–	Local active menu	Local active menu	S	–	–	Initiation from call with C station. B station is put on hold.

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
End three-party conference	–	3-PTY (local S_0 WpC functionality)	–	–	–	GS	–	Local active menu	Local active menu	S	–	RH, BR, WA, RG, BS, RK	Status as prior to conference call. Dialog menu provides further options for ending conference
Conference (up to 5 stations)	*3	–	*3	–	V	GS	U1	Local active menu	Local active menu	D, E, N, C	–	–	Initiation from call
End conference (up to 5 stations)	#3	–	#3	–	V	GS	U1	Local active menu	Local active menu	D, E, N, C	–	RH, BR, WA, RG, BS, RK	Status as prior to conference call. Dialog menu provides further options for ending conference.
Call charge display for own station (GET)	–	–	*65	–	V	–	H	–	–	D	X	–	Deletion only by system administrator
Save/change speed dialing system/individual	*92+ISD no.+Stn. no.	–	*92...	–	–	–	H	Local ETD feature	Local ETD feature	D, E, N, C	X	RK, BS	ISD 0 ... 9 Mobile phones also have an additional local procedure
Dial station speed-dialing (SSD)	*7+ISD no.	–	*7...	–	V, U	–	H	Local ETD feature	Local ETD feature	A	X	RK, BS	000 ... 999 Mobile phones also have an additional local procedure
Dial system speed-dialing (SSD)	*7+ISD no.	757...	*7...	–	V, U	–	H	Private ETD feature	Private ETD feature	A		RK, BS	000 ... 999

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
	Code + procedure	Code	Code	Key		Menu		Code	Code		via lock code	Status locking on	
				Fixed	Programmable bar	Dialog	Service						
Trunk queuing, automatic	–	–	–	–	V		–	–	–	E, N, C	X	RH, BR, RG, RK, GS	Automatically after timeout if enabled in the CDR
Trunk queuing, manual	–	–	–	–	V	BS	–	–	–	D	X	RH, BR, RG, RK, GS	Activation by pressing a key if enabled in the CDR
Toggle	*2	–	*2	–	V	GS	U1	Mouse click, Key	Local active menu	D, E, N, C	–	–	Also available using the DSS, GESP, LTG and MUSAP key.
DTMF transmission	*53	–	*53	–	U	–	H	Menu, key	Local feature	D, E, N, C	–	RH, BR, WA, RG, RK, BS	
DTMF transmission prior to connect	–	–	–	–	–	–	–	–	–	D, E, N, S	–	RK, BS	Only permitted in ISD/SSD mode and from the ENB. Switchover performed using #key
Microphone off (mute on)	*52 (if microphone available)	–	*52	X, T	V, T	GS	U1	Local active menu	Local active menu	D, E (if microphone is available)	–	–	Unavailable for workpoint clients without a speakerphone if handset is on-hook

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Microphone on (mute off)	#52 (if microphone available)	–	#52	X, T	V, T	BR, WA, RG, GS, BS	U1	Local active menu	Local active menu	D, E	–	–	
Mobility/replace call numbers	–	–	*9419	–	U	–	U1	Possible using central database	Possible using central database				Only for mobile call numbers
			Not for TDM workpoint clients with display or CMI feature mobile phones										
Night answer on	*44+ wait (5 s) or * or Stn. no.	75...	*44...	–	V, U, T	RH	U1	–	Feature key	A	X	RK, BS	Standard night answer using * or after 5 s timer
Night answer off	#44+ wait (5 s) or * or Stn. no.	7644	#44	–	V, T	RH	U1	–	Feature key	A	X	RK, BS	
Repertory key/ DSS	–	–	–	–	V	–	–	Speed dialing key	Speed dialing key	D	X	–	Key can be assigned an internal or external call number. Telephone locking for external repertory key only.
Paging, see speaker call to a group													
Park on	*56+Park slot	Suspend (local S_0 WpC functionality)	*56..	–	U, T	–	H	Key, Menu	Local active menu	A	–	RH, BR	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Retrieve call	#56+Park slot	Resume (local S_0 WpC functionality)	#56...	–	U, T	–	H	Key, Menu	Local feature menu	A	–	WA, EG, GS, RK, BS	
Paging system (PSE comfort), paging	–	–	*45..	–		–		–	–	A	–	–	
Paging system (PSE comfort), meet me	#45+Stn. no.	7645..	#45..	–	–	–	H	–	–	A	–	–	
Account code	*60+ACCT	7560...	*60...	–	U	–	H	–/mandatory ACCT possible	–/mandatory ACCT possible	A	X	WA, RG, RK, BS	ACCT can also be entered without service code following ext. line seizure.
Route seizure	See numbering plan	See numbering plan	See numbering plan	–	V	–	–	See numbering plan	See numbering plan	A	X	–	Telephone lock only permitted for seizure of outgoing lines.
RS232 failure signaling	–	–	–	–	–	–	–	–	–	D	–	–	
Set callback	*58	CCBS (local S_0 WpC functionality)	*58	–	V, T	RG	U1	Local active menu	Local active menu	A	–	RH, BR, WA, GS, RK, BS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
View or delete callback requests	#58	CCBS (local S_0 WpC functionality)	#58...	–	U, T	RH	U1	Local feature menu	Local feature menu	A	X	RH, BR, WA, GS, RK, BS	
Initiate callback (exclusive hold)	DP: Dial CMI, DTMF: Flash TDM WpC without display: Consultation hold key	HOLD (local S_0 WpC functionality)	–	–	–	GS	–	Drag& Drop, menu	By dialing new number	A	–	–	
Call number suppression on, temp.	*86	CLIR (local S_0 WpC functionality)	*86	–	V, T	RH	U1	Feature menu	Feature menu	A	X	RK, BS	
Call number suppression off, temp.	#86	CLIP (local S_0 WpC functionality)	#86	–	V, T	RH	U1	Feature menu	Feature menu	A	X	RK, BS	
Station number, assign for MUSAP	*41+DID no.	7541...	*41...	–	V	–	H	–	–	A	X	–	This must be followed by seizure of external line.
Ring transfer executive/secretary	*502+MULAP	75502	*502	–	V, T	–	H	–	–	A	X		Only for member of the executive MULAP groups
Ringing group on	*81+Stn. no.	7581...	*81...	–	U, V, T	–	H	–	–	A	X	RK, BS	
Ringing group off - all members removed	#81	7681	#81	–	U, V, T	RH	H	–	–	A	X	RK, BS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easy-Com	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Ringer cutoff on	–	–	*98	–	V, T	RH	U1	Local feature	Local feature	D	X	RK, BS	A short advisory tone is activated. The optical signals are retained.
Ringer cutoff off	–	–	#98	–	V, T	RH	U1	Local feature	Local feature	D	X	RK, BS	
Hunt group, join	*85	7585	*85	–	V, T	RH	U1	Feature menu	Feature menu	A	X	RK, BS	All hunt groups, join = *85*
Hunt group, leave	#85	7685	#85	–	V, T	RH	U1	Feature menu	Feature menu	A	X	RK, BS	All hunt groups, leave = #85#
Service menu	–	–	–	X, T	–	–	–	–	–	D	–	BS	Service key as for stopping and starting procedure
Remote service call	*994+Index+Suffix dialing	75944	*994	–	–	–	U1	–	–	A	–	–	
Silent monitoring	*944+Stn. no.		*944..	–	–	–	–	–	–	D, E, C	X	WA, RG, BS, RK	Only for selected countries and for authorized stations, not for IP WpC
Trunk flash on analog trunk	*51	–	*51	–	V	–	H	–	–	D, E, N, C	X	–	
Speaker on/off	– (if loudspeakers available)	–	–	X, T	–	–	–	PC feature	PC feature	D, E (if loudspeakers are available)	–	–	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
	Code + procedure	Code	Code	Key		Menu		Code	Code		via lock code	Status locking on	
				Fixed	Programmable bar	Dialog	Service						
Silent ringing, see ringer cutoff												–	
Language selection			*48					At login	At login			–	
Substitution code for '*'	75	75	75	–	–	–	–	–	–	A	–	–	
Substitution code for '#'	76	76	76	–	–	–	–	–	–	A	–	–	
System administration	–	–	*95...	–	–	–	H	–	–	D	See notes	WA, RG, RK, BS	Only for authorized stations via access code. User data is protected via telephone lock feature.
System administration, remote DTMF administration and maintenance, enable (service system)	–	–	*991...	–	–	–	–	–	–	D	–	WA, RG, RK, BS	
System administration, remote DTMF administration and maintenance, enable (customer system)	–	–	*992...	–	–	–	–	–	–	D	–	WA, RG, RK, BS	Only for authorized stations via access code.

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Enable system administration via HOST (also remote)	–	–	*993 ...	–	–	–	–	–	–	D	–	WA, RG, RK, BS	Only for authorized stations via access code.
Key programming	–	–	*91...	–	–	–	H	Local	Local	D	X	RK, GS	
Toll fraud monitoring	–	–	–	–	–	–	–	–	–	D	X	–	Only for attendant, if enabled
Internal phonebook	–	–	–	–	V	RH, BR, GS	–	Private (local directory on PC) + LDAP interface		D	–		
Telephone data service (TDS)	*42	7542	*42	–	U,V	–	H	–	Feature key	A	–	RK, BS	
Activate timed reminder	*46+time	7546...	*46..	–	U, V, T	–	H	–	–	D, N, E, C	X	–	
Deactivate timed reminder	#46+time	7646...	#46..	–	U, V, T	–	H	–	–	D, N, E, C	X		
Trace Stop	*509	–	*509	–	V	–	–	–		A	–	–	
Disconnect key	–	–	–	–	V	–	–	Local active menu, key	Local active menu, key	A	–	–	
Enable door opener, DTMF	*89+Stn. no.+Code	7589	*89...	–	U, V, T	–	H	–	–	A	X	–	
Disable door opener, DTMF	#89+Stn. no.+Code	7689	#89...	–	U, V, T	–	H	–	–	A	X	–	
Door opener via adapter cabinet	*61+Stn. no.	7561	*61...	–	U, V	GS	H	–	–	A	–	–	Only if entrance telephone is configured

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Transfer (screened/unscreened)	–	ECT (local S_0 WpC functionality)	–	–	–	RG, GS	–	Drag&Drop, Menu Key	Local active menu	A	–	–	
Overload indication	–	–	–	–	V	–	–	–	–	D	–	–	For France only
Call pickup, directed	*59+Stn. no.	7559...	*59...	–	U	–	H	Using status-supported speed dialing keys	Using status-supported speed dialing keys	A	–	WA, RG, RK, BS	
Call pickup in pickup group	*57	7557	*57	–	V	RH, BR, GS	U	–	–	A	–	WA, RG, RK, BS	
Pick up	DTMF: Flash TDM WpC without display: Consultation hold key	–	–	–	–	GS	–		GS	D, N, E, C	–	–	
Extending undialed lines	–	–	–	–	–	WA	–	–	–	D	–	–	Only for authorized stations
AC call (see numbering plan)	9	9	9	–	–	–	–	9	9	A	–	–	
Number redial	Redial key	–	–	X	–	–	–	Local feature	Local feature	D, E, C	X	–	Cannot be programmed under DSS.

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Sup-ported work-point clients (see abbre-via-tions in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog work-point clients[1]	S_0 work-point cli-ents	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiCli-ent 130 V5.0 easy-Com	optiCli-ent 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Retrieval of ex-ternal call placed on common hold	*63+Trunk code	7563..	*63..	–	V	–	H	Local feature menu	Local feature menu	A	–	–	Retrieval also pos-sible with trunk key
Central tele-phone lock	*943+Stn. no.+ * or #	75943..	*943..	–	U	–	H	–	–	A	X		Only for authorized stations
Return to held call (exclusive hold off)	*0 or CMI, DTMF: Flash TDM WpC with-out display: Consultation hold key	Retrieve	*0	–	–	BR, WA, RG, GS, BS	U1	Mouse click, key	Local active menu				
Application sharing								Mouse click		A	–		
Image display of called party								Drag& Drop, Mouse click					
Internet/Web-Browser inte-grated								Drag& Drop, Mouse click					
E-mail integra-tion								Drag& Drop, Mouse click					
Modifiable de-sign								X					
Missing call in-dication								X					

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for									Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients, optiClient 130 V5.0 phone					optiClient 130 V5.0 easyCom	optiClient 130 V5.0 office				
				Key		Menu							
	Code + procedure	Code	Code	Fixed	Programmable bar	Dialog	Service	Code	Code		via lock code	Status locking on	
Call duration counter for incoming and outgoing calls								X					
Extended call list features (for example, delete individual entries, delete identical entries)								X					
Intelligent headset/handset support								X					
Find automatic park slot								X					

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

---

[1] The codes are valid for DTMF telephones. Substitution codes 75 and 76 must be entered instead of “*” and “#” for DP telephones.

Description of the different workpoint client groups from Table B-1

Table B-2 Description of the Different Workpoint Client Groups

Workpoint client group	Description/examples	Abbreviation
All workpoint clients	All workpoint clients listed below	A
TDM workpoint clients without display	● optiPoint 500 entry ● optiset E entry ● optiset E basic	E
TDM workpoint clients with display	● optiPoint 500 economy (not for U.S.) ● optiPoint 500 basic ● optiPoint 500 standard ● optiPoint 500 advance ● optiPoint 600 office (in UP0/E mode) ● optiset E standard ● optiset E advance plus/comfort ● optiset E advance conference/conference ● optiset E memory	D
analog workpoint clients	DP and DTMF terminals	N
S0 workpoint clients	ISDN terminals	S
IP workpoint clients	● optiPoint 400 standard 3.0 ● optiPoint 400 economy 3.0 ● optiPoint 410 entry (without display) ● optiPoint 410 economy ● optiPoint 410 standard ● optiPoint 410 advance ● optiPoint 420 economy ● optiPoint 420 economy plus ● optiPoint 420 advance ● optiPoint 600 office (in IP mode)	I
CMI mobile phones	Gigaset 1000	C
CMI feature mobile phones	● Gigaset 3000 Comfort ● Gigaset 3000 Micro ● Gigaset 4000 Comfort ● Gigaset 4000 Micro	

C IP Protocols and Port Numbers Used with HiPath 3000/5000 V5.0

This supplement contains information about the HiPath 3000/5000 V5.0 components mentioned in the following table.

The necessary information for erecting firewalls is provided on each component. Firewalls ensure that customer intranets are protected from external access.

Information on applications that can be used in HiPath 3000/5000 V5.0 can be found in the relevant product documentation.

Topic
HiPath 3000, page C-2
HiPath 5000, page C-3
HiPath ComScendo Service, page C-5
HiPath FM Managed Systems, page C-7
HG 1500, page C-8
optiClient 130 V5.0, page C-11
optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600 office, page C-12
HiPath AP 1120, page C-14
Middleware for Call Control, page C-15

C.1 HiPath 3000

Table C-1 HiPath 3000 - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
Telnet	TCP	23	–		Administration via Assistant T	No
TFTP	UDP	69	X		APS transfer via TFTP, HiPath 5000 network	No
ADM	TCP	7000	–	Feature Server	HiPath 5000 network	Yes
CSTA	TCP	7001	–		HiPath 5000 network	No
SYNC	TCP	7024	–	Feature Server	HiPath 5000 network	Yes
FCT	TCP	7100	–	Feature Server	HiPath 5000 network	Yes
SNMP (Get/ Set)	UDP	161	–		SNMP browser, HiPath FM	No
Resource Manager	TCP	9000	–	HiPath 3000/ 5000	Network-wide resource management	Yes
Online Trace Report	TCP	21965	–	XTrace	Online Trace Tool	No

C.2 HiPath 5000

Table C-2 HiPath 5000 - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
CAR_Server	TCP	12063	–		HiPath 5000 network	Yes
REG_Server	TCP	12061	–	HG 1500	HiPath 5000 network	Yes
TFTP Server	UDP	69	–		APS transfer via TFTP	Registry entry
HiPath FM Server	UDP	161	X	Managed system	SNMP (Get/Set)	FM property files
HiPath FM Server	UDP	162 (or 3162)	–	optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130, eCS, PCS	SNMP (Traps)	FM property files
HiPath FM Server	RMI	3042, defined port range 3050 - 3065	–	HiPath FM Client	Communication from Client to HiPath FM Server	FM property files
HiPath FM Server	Socket: proprietary protocol	3041, 3043, 3044, 3045	–	HiPath FM Client	Communication from Client to HiPath FM Server	FM property files
SQL Server	TCP	1433	–		Feature Server database, CCMC, Get Account	
SQL Server	UDP	1434	–			
SW Viewer (SNMP)	UDP	161	–		Between application servers: SW Viewer to SW Viewer	No
Deployment tool	UPD	5100	–		Software upgrade	No

Table C-2 HiPath 5000 - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
FTP Server	FTP	21	–	Deployment Tool, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600	FTP Server	No
DNS	UDP	53	–	optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130	ADS name resolution	No
DHCP	UDP	67	–	optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130 (PC)	IP address allocation	No

C.3 HiPath ComScendo Service

Table C-3 HiPath ComScendo Service - IP Protocols and Port Numbers Used

Service/ Application	**Protocol**	**Server Port**	**Connect With Other Servers**	**Possible Clients**	**Application**	**Configurable**
H.225 RAS	TCP	1719	–	Netmeeting, AP 1120	Voice over IP: registration, admission	Yes
H.225 Call Signaling	TCP	1720	X	HG 1500, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130, Netmeeting, AP 1120	Voice over IP: connection control	Yes
H.323 Dynamic Ports	TCP	12250 - 12950	X	HG 1500, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130, Netmeeting, AP 1120	Voice over IP: connection control for voice channels (media channels)	Yes
VOPTISET	TCP	4060	–	optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130	Voice over IP: control of system clients	Yes
IPNC	TCP	12051	–	HG 1500	Voice over IP: media gateway control	Yes
SNMP (Get/ Set)	UDP	161	–	SNMP browser, HiPath FM	SNMP browser, HiPath FM	No
SNMP (Traps)	UDP	162	X	optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130	Sending/receiving SNMP error messages	No

Table C-3 HiPath ComScendo Service - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
Call Address Resolution CAR	TCP	12062	X	HG 1500	Call number server, call monitoring (can be activated via administration)	Yes
CAR Alive with Ping	ICMP		X		Call monitoring (can be activated via administration) Type 8; Code 0 Echo Request Type 0; Code 0 Echo Reply	
Online Trace Report	TCP	2048	–	XTracer	Online Trace Tool	No
HTTP	TCP	8085	–		Web-Based Management	No
SSL	TCP	443	–			No
TFTP	UDP	69	X		APS transfer via TFTP, HiPath 5000	No
ADM	TCP	7000	–	Feature Server	HiPath 5000	Yes
CSTA	TCP	7001	–		HiPath 5000	No
SYNC	TCP	7024	–	Feature Server	HiPath 5000	Yes
FCT	TCP	7100	–	Feature Server	HiPath 5000	Yes
SNMP (Get/ Set)	UDP	161	–		SNMP browser, HiPath FM	No
Resource Manager	TCP	9000	–	HiPath 3000/ 5000	Network-wide resource management	Yes
Online Trace Report	TCP	21965	–	XTrace	Online Trace Tool	No

C.4 HiPath FM Managed Systems

Table C-4 HiPath FM Managed Systems - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
HTTP Communication Server, Web Server, IIS	TCP	80, 280, 8085, 8080, 8170, 8888, 9170	–	HiPath FM Server	HiPath Server: for communication with systems to be managed (port 8170 and 9170 added for detecting TelasWeb), PCM	No
HTTP Communication Server	TCP	80, 280, 8085, 8080, 8170, 8888, 9170	–	HiPath FM Client	Launch of detected http services on systems to be managed.	No
Telnet	TCP	23	–	HiPath FM Server	Telnet integration of systems to be managed (HDMS 3.6) Not required for HTS 6.0 scenarios	No
SNMP Service	UDP	161	–	HiPath FM Server	SNMP (Get/Set)	No
“Ping” Management Service	TCP	7	–	HiPath FM Server	IP status polling of systems to be managed	No
Element Manager/Local Manager	Depends on the application used	Unknown	–	HiPath FM Client	Launch of Element Manager/ Local Manager of customer system (e.g. HiPath 4000 Assistant)	No

C.5 HG 1500

Table C-5 HG 1500 - IP Protocols and Port Numbers Used

Service/ Application	**Protocol**	**Server Port**	**Connect With Other Servers**	**Possible Clients**	**Application**	**Configurable**
H.225 RAS	TCP	1719	–	Netmeeting, AP 1120	Voice over IP: registration, admission	Yes
H.225 Call Signaling	TCP	1720	X	HG 1500, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130, Netmeeting, AP 1120	Voice over IP: connection control	Yes
H.323 Dynamic Ports	TCP	12250 - 12950	X	HG 1500, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130, Netmeeting, AP 1120	Voice over IP: connection control for voice channels (media channels)	Yes
RTP/RTCP	UDP	29100 - 29131	X	HG 1500, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130, Netmeeting, AP 1120, MEB	Voice over IP: transmission of voice packets	Yes
VOPTISET	TCP	4060	–	optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130	Voice over IP: control of system clients	Yes
IPNC	TCP	12051	–	HG 1500	Voice over IP: media gateway control	Yes

Table C-5 HG 1500 - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
Media Payload Handler	TCP	12052	–	HG 1500	Voice over IP: media gateway control	Yes
SNTP	UDP	123	X	HG 1500, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130	Time server	No
VCAPI	TCP	12001	–	VCAPI client (e.g. telematics SW AVM Fritz!32)	Call control and media transmission	No
Accounting Server	TCP	13042	–	IP accounting (e.g TeleData Office)	IP accounting	No
SNMP (Get/ Set)	UDP	161	–	SNMP browser, HiPath FM	SNMP browser, HiPath FM	No
SNMP (Traps)	UDP	162	X	optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130	Sending/receiving SNMP error messages	No
DSL Diagnostics Server	UDP	12200	–	DSL Status Tool	DSL status display	No
Call Address Resolution CAR	TCP	12062	X	HG 1500	Call number server, call monitoring (can be activated via administration)	Yes
CAR Alive with Ping	ICMP		X		Call monitoring (can be activated via administration) Type 8; Code 0 Echo Request Type 0; Code 0 Echo Reply	

Table C-5 HG 1500 - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
Telnet	TCP	23	–		Remote CLI with restricted functionality. Telnet is disabled in secure mode.	No
TFTP	UDP	69	X		APS transfer, CDB backup via TFTP	No
Online Trace Report	TCP	2048	–	XTrace	Online Trace Tool	No
HTTP	TCP	8085	–		Web-Based Management	No
SSL	TCP	443	–			No

C.6 optiClient 130 V5.0

Table C-6 optiClient 130 V5.0 - IP Protocols and Port Numbers Used

Service/ Application	**Protocol**	**Server Port**	**Connect With Other Servers**	**Possible Clients**	**Application**	**Configurable**
VOPTISET	TCP	4060	X	HG 1500	Voice over IP: control of system clients	No
H.323 (H.225/ Q931)	TCP	1720	X	HG 1500	Voice over IP: connection control	No
H.245	TCP	12000 - 12100	X	HG 1500	Voice over IP: connection control for voice channels (media channels)	via Graphical User Interface GUI
RTP	UDP	29100 - 29131	X	HG 1500, optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600, optiClient 130	Voice over IP: transmission of voice packets	Via Graphical User Interface (GUI)
T.120	TCP	1503	X	optiClient 130 easyCom, Netmeeting	Application sharing	No

Service/ Application	**Protocol**	**Client Port**	**Port**	**Server**	**Application**	**Configurable**
VOPTISET	TCP	1024 - 65535	HG 1500 4060		Voice over IP: control of system clients	Via Graphical User Interface (GUI)

C.7 optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600 office

The workpoint clients support the flexible configuration (Flexible Port Numbering) of each TCP and UDP port number, with the exception of:

- SNMP
- SNTP
- DNS
- WAP Push
- WAP Push secure

The following table shows the configurable port numbers and their output parameters. The Port Base Number is used in some cases. The Port Base Number is the configurable port number, not the port numbers derived from the Port Base Number.

Table C-7 optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600 office - Used IP Protocols and Port Numbers

Function	Default port		Note
	UDP	TCP	
H.225.0 RAS Port Area		1720	
H.225.0 Call Signaling Port Area		1720	
H.245 TCP Channel Port Area (Local)		1720	
H.245 TCP Channel Port Area (Remote)		Any	
RTP Port Area (Local)	5010, 5012, 5014, 5016		The RTP port number is even-numbered. The RTCP port number is equivalent to the RTP port number + 1. 5004 to 5007 are reserved by IANA.
RTP Port Area (Remote)	Any		
RTCP Port Area (Local)	5011, 5013, 5015, 5017		The RTP port number is even-numbered. The RTCP port number is equivalent to the RTP port number + 1. 5004 to 5007 are reserved by IANA.
RTCP Port Area (Remote)	Any		
HTTP Hypertext Transport Protocol		8085	
HTTPS Secure Hypertext Transport Protocol		443	
SNMP	161		Not configurable

Table C-7 optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600 office - Used IP Protocols and Port Numbers

Function	**Default port**		**Note**
	UDP	**TCP**	
SNMP Traps	162		Not configurable
SNTP	123		Not configurable
SNTP Heartbeat	580		Not configurable
DNS	53		
DHCP Server Port	67		Standard BOOTP port numbers. Not configurable
DHCP Client Port	68		Standard BOOTP port numbers. Not configurable
FTP		21	
Telnet	23	23	
TFTP	69		Not configurable
LDAP	389	389	
WAP	2948	2948	WAP Push. Not configurable
	9200	9200	WAP Connectionless Session Service
Service Agent Request Port	5100		SA base port The default value is = 5100
Auto Detection	5100		SA base port + 0
CTI Service	5105	5105	SA base port + 5
Debug Port	5110	5110	SA base port + 10
Terminal Emulator Port	5115	5115	SA base port + 15
Signaling Emulator Port	5120	5120	SA base port + 20
Test Service	5125	5125	SA base port + 25
Config Service	5130	5130	SA base port + 30
Resource Sharing	5135	5135	SA base port + 35
HFA CTI Service	5140	5140	SA base port + 40
QDC Server	12010	12010	
DLS	443	443	

C.8 HiPath AP 1120

Table C-8 HiPath AP 1120 - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
H.323 (H.225/ Q931)	TCP	1720	X	HG 1500	Voice over IP: connection control	No
H.323 (H.245)	TCP	1024 - 65535	X	HG 1500	Voice over IP: connection control for voice channels (media channels)	No
RTP/RTCP	UDP	5004 - 5130	X	HG 1500	Voice over IP: transmission of voice packets RTP = Port 5004, 5006, 5008, ... 5130. RTCP = RTP port + 1	No
HTTP	TCP	8085	–	Administration PC with browser	HTTP Web interface for administration	No

C.9 Middleware for Call Control

Table C-9 Middleware for Call Control - IP Protocols and Port Numbers Used

Service/ Application	Protocol	Server Port	Connect With Other Servers	Possible Clients	Application	Configurable
TAPI 120	TCP	–	X		TAPI Service Provider	No
TAPI 170 V2	TCP	8503	–		TAPI Service Provider	No
CMD	TCP	8000 + node ID (presently 8001 - 8064), 7700	–	TAPI 120	CSTA Message Dispatcher	Via user interface
CSP	TCP	8000, 8800	–		CSTA Service Provider	Via user interface

D Identifying System Power Requirements

The following values are for orientation only, and can vary depending on the traffic flow.

This supplement specifies the power requirement of the boards and components of the HiPath 3000 systems. In addition, information is provided on the power requirement of the different workpoint clients, key modules and adapters.

With this information,

- the individual system power requirement can be identified.
- every system configuration can be checked to see whether the nominal output of the power supply unit is sufficient or whether an additional power supply may be needed.

Topic
HiPath 3800 Board Power Requirement, page D-2
HiPath 3750 and HiPath 3700 Board Power Requirement, page D-4
HiPath 3550 Board Power Requirement, page D-6
HiPath 3350 Board Power Requirement, page D-8
HiPath 3500 Board Power Requirement, page D-10
HiPath 3300 Board Power Requirement, page D-11
Workpoint Clients, Key Modules and Adapter Power Requirements, page D-12
Checking Whether the Output of a Power Supply Unit is Sufficient, page D-14
Identifying the Primary System Power Requirement, page D-17

To ensure that a system’s dynamic capacity limit is not exceeded, the configuration can be tested using the project planning tool (Intranet: http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index.htm).

D.1 HiPath 3800 Board Power Requirement

Table D-1 Nominal Output of the HiPath 3800 Power Supply Unit

Power Supply Unit	Part Number	Max. Nominal Output in W	
		5 V	–48 V
LUNA2	S30122-K7686-L1 S30122-K7686-M1	140[1]	

[1] The total max. nominal output at the 5-V and at the –48-V output is 140 W. The 5-V nominal output can vary between 30 and 60 W and the –48-V nominal output can vary between 80 and 110 W. In other words, if 30 W are withdrawn at the 5-V output, a maximum of 110 W is available at the –48-V output.

You must check whether the total power requirement of the boards used and the connected workpoint clients of a system cabinet exceeds the maximum possible LUNA2 output. Section D.8 contains a sample calculation.

Table D-2 HiPath 3800 Board Power Requirement

Board or Component	Part Number	Net Power Requirement in W	
		5 V	–48 V
CBSAP	S30810-Q2314-X	10.0	–
DBSAP	S30807-Q6722-X	1.5	–
DIU2U	S30810-Q2216-X	5.1	–
DIUN2	S30810-Q2196-X	5.0	–
IVMN8	S30122-H7688-X100	10.0	–
IVMNL	S30122-H7688-X	10.0	–
PDMX	S30807-Q5697-X200	3.0	–
REALS	S30807-Q6629-X	1.5	–
SLCN	S30810-Q2193-X300	5.0	–
SLMA	S30810-Q2191-C300	1.6	12.0
SLMA8	S30810-Q2191-C100	0.6	4.0
SLMO2	S30810-Q2168-X10	1.0	1.2
SLMO8	S30810-Q2168-X100	0.4	0.4
STMD3	S30810-Q2217-X10	4.0	–
	S30810-Q2217-X110	4.0	1.5
STMI2	S30810-Q2316-X100	16.3	–

Table D-2 HiPath 3800 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
TM2LP	S30810-Q2159-Xxxx	1.8	–
TMC16	S30810-Q2485-X	1.3	–
TMDID	S30810-Q2452-X	2.3	6.6
TMEW2	S30810-Q2292-X100	1.3	3.1

D.2 HiPath 3750 and HiPath 3700 Board Power Requirement

Table D-3 Nominal Output of the HiPath 3750 Power Supply Unit and HiPath 3700

Power Supply Unit	**Part Number**	**Max. Nominal Output in W**	
		5 V	**–48 V**
UPSM	S30122-K5950-A100 S30122-K5950-S100 S30122-K5959-S121 (for RSA only)	60.0	166.0

ⓘ You must check whether the total power requirement of the boards used and the connected workpoint clients of a system cabinet exceeds the maximum possible UPSM output. Section D.8 contains a sample calculation.

Table D-4 HiPath 3750 and HiPath 3700 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
BS3/1	S30807-H5482-X	–	2.0
BS3/3	S30807-H5485-X	–	3.0
CBCPR (including sub-boards)	S30810-Q2936-X	8.5	–
GEE8	S30817-Q664-xxxx	1.0	–
HXGM3	S30810-Q2942-X	12.0	–
IVML8	S30122-X7380-X100	3.0	0.7
IVML24	S30122-X7380-X	5.0	1.0
PDM1	S30807-Q5692-X100	–	5.0
REAL	S30807-Q5913-X	0.5	–
SLA8N	S30810-Q2929-X200	1.5	1.5
SLA16N	S30810-Q2929-X100	3.0	3.0
SLA24N	S30810-Q2929-X	4.5	4.5
SLC16	S30810-Q2922-X	8.0	–
SLC16N	S30810-Q2193-X100	5.0	–
SLMO8	S30810-Q2901-X100	0.7	–
SLMO24	S30810-Q2901-X	1.5	–

Table D-4 HiPath 3750 and HiPath 3700 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
STMD8	S30810-Q2558-X200	2.0	–
TIEL	S30810-Q2520-X	1.0	–
TMAMF	S30810-Q2587-A200	1.8[1]	16.9[1]
TMCAS	S30810-Q2938-X	Not Available	
TMDID8	S30810-Q2507-X	1.4[1]	23.8[1]
TMGL8	S30810-Q2703-X	1.6[1]	2.1[1]
TML8W	S30817-Q626-Axxx/Bxxx	1.0	–
TMST1	S30810-Q2920-X	3.0	–
TMS2	S30810-Q2915-X	3.0	–

[1] Identified at a traffic flow of 0.8 Erlang

D.3 HiPath 3550 Board Power Requirement

Table D-5 Nominal Output of the HiPath 3550 Power Supply Units

Power Supply Unit	Part Number	Max. Nominal Output in W	
		5 V	**–48 V**
UPSC-D	S30122-K5660-M300	40.0	53.0
UPSC-D with EPSU2	S30122-K5660-M300 with S30122-K7221-X2	40.0	140.0

You must check whether the total power requirement of the boards used and the connected workpoint clients exceeds the maximum possible output of the UPSC-D with or without EPSU2. Section D.8 contains a sample calculation.

Table D-6 HiPath 3550 Board Power Requirement

Board or Component	Part Number	Net Power Requirement in W	
		5 V	**–48 V**
BS3/1	S30807-H5482-X	–	2.0
BS3/3	S30807-H5485-X	–	3.0
CBCC (including submodules)	S30810-Q2935-A301	7.0	0.5
GEE12	S30817-Q951-Axxx	0.5	–
GEE16	S30817-Q951-Axxx	0.5	–
GEE50	S30817-Q951-Axxx	0.5	–
HXGS3 (including ventilator kit)	S30810-Q2943-X	10.0	2.8
HXGS3 (excluding ventilator kit)	S30810-Q2943-X	10.0	–
IVMS8	S30122-Q7379-X	2.6	0.3
PDM1	S30807-Q5692-X100	–	5.0
SLA8N	S30810-Q2929-X200	0.2	0.5
SLA16N	S30810-Q2929-X100	3.0	3.0
SLA24N	S30810-Q2929-X	4.5	4.5
SLC16	S30810-Q2922-X	8.0	–
SLC16N	S30810-Q2193-X100	5.0	–

Table D-6 HiPath 3550 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
SLMO24	S30810-Q2901-X	1.5	–
SLU8	S30817-Q922-A301	0.8	–
STLS2	S30817-Q924-B313	0.6	–
STLS4	S30817-Q924-A313	1.0	–
STRB	S30817-Q932-A	0.5	–
TLA2	S30817-Q923-Bxxx	0.1	–
TLA4	S30817-Q923-Axxx	0.2	–
TLA8	S30817-Q926-Axxx	0.4	–
TMAMF	S30810-Q2587-A400	1.8[1]	16.9[1]
TMCAS	S30810-Q2938-X	Not Available	
TMGL4	S30810-Q2918-X	4.7[1]	0.1[1]
TMQ4	S30810-Q2917-X	3.8	–
TST1	S30810-Q2919-X	0.8	–
TS2	S30810-Q2913-X300	0.9	–
V24/1	S30807-Q6916-X100	0.3	–
4SLA	S30810-Q2923-X200	0.7	0.7
8SLA	S30810-Q2923-X100	1.3	1.3
16SLA	S30810-Q2923-X	2.5	2.5

[1] Identified at a traffic flow of 0.8 Erlang

D.4 HiPath 3350 Board Power Requirement

Table D-7 Nominal Output of the HiPath 3350 Power Supply Units

Power Supply Unit	**Part Number**	**Max. Nominal Output in W**	
		5 V	**–48 V**
PSUP	S30122-K5658-M	15.0	19.2
UPSC-D	S30122-K5660-M300	20.0[1]	53.0
UPSC-D with EPSU2	S30122-K5660-M300 with S30122-K7221-X2	40.0	140.0

[1] Nominal output = 40 W. Due to build-up of heat, not more than 20 W may be withdrawn.

> You must check whether the total power requirement of the boards used and the connected workpoint clients exceeds the maximum possible output of the PSUP or the UPSC-D with or without EPSU2. Section D.8 contains a sample calculation.

Table D-8 HiPath 3350 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
BS3/1	S30807-H5482-X	–	2.0
BS3/3	S30807-H5485-X	–	3.0
CBCC (including submodules)	S30810-Q2935-A301	7.0	0.5
GEE12	S30817-Q951-Axxx	0.5	–
GEE16	S30817-Q951-Axxx	0.5	–
GEE50	S30817-Q951-Axxx	0.5	–
HXGS3 (including ventilator kit)	S30810-Q2943-X	10.0	2.8
IVMP8	S30122-Q7379-X100	2.6	0.3
PDM1	S30807-Q5692-X100	–	5.0
SLU8	S30817-Q922-A301	0.8	–
STLS2	S30817-Q924-B313	0.6	–
STLS4	S30817-Q924-A313	1.0	–
STRB	S30817-Q932-A	0.5	–
TLA2	S30817-Q923-Bxxx	0.1	–

Table D-8 HiPath 3350 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
TLA4	S30817-Q923-Axxx	0.2	–
TLA8	S30817-Q926-Axxx	0.4	–
TMGL4	S30810-Q2918-X	4.7[1]	0.1[1]
TMQ4	S30810-Q2917-X	3.8	–
V24/1	S30807-Q6916-X100	0.3	–
4SLA	S30810-Q2923-X200	0.7	0.7
8SLA	S30810-Q2923-X100	1.3	1.3
16SLA	S30810-Q2923-X	2.5	2.5

[1] Identified at a traffic flow of 0.8 Erlang

D.5 HiPath 3500 Board Power Requirement

Table D-9 Nominal Output of the HiPath 3500 Power Supply Units

Power Supply Unit	**Part Number**	**Max. Nominal Output in W**	
		5 V	**–48 V**
UPSC-DR	S30122-K7373-M900	40.0	53.0
UPSC-DR with EPSU2R[1]	S30122-K7373-M900 with S30122-K7221-X900	40.0	140.0

[1] Installed in expansion cabinet ECR S30777-U711-E901

> You must check whether the total power requirement of the boards used and the connected workpoint clients exceeds the maximum possible output of the UPSC-DR with or without EPSU2-R. Section D.8 contains a sample calculation.

Table D-10 HiPath 3500 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
BS3/1	S30807-H5482-X	–	2.0
BS3/3	S30807-H5485-X	–	3.0
CBRC (including submodules)	S30810-Q2935-Z301	7.0	0.5
HXGR3	S30810-K2943-Z	10.0	–
IVMS8R	S30122-K7379-Z	2.6	0.3
Fan for HiPath 3500	–	–	1.4
PDM1	S30807-Q5692-X100	–	5.0
SLU8R	S30817-K922-Z301	0.8	–
STLS4R	S30817-K924-Z313	1.0	–
STRBR	S30817-Q932-Z	0.5	–
TLA4R	S30817-Q923-Zxxx	0.2	–
TMGL4R	S30810-K2918-Z	5.7[1]	0.1[1]
TST1	S30810-K2919-Z	0.8	–
TS2R	S30810-K2913-Z300	0.9	–
8SLAR	S30810-K2925-Z	1.3	1.3

[1] Identified at a traffic flow of 0.8 Erlang

D.6 HiPath 3300 Board Power Requirement

Table D-11 Nominal Output of the HiPath 3300 Power Supply Units

Power Supply Unit	**Part Number**	**Max. Nominal Output in W**	
		5 V	**–48 V**
UPSC-DR	S30122-K7373-M900	20.0[1]	53.0
UPSC-DR with EPSU2R[2]	S30122-K7373-M900 with S30122-K7221-X900	40.0	140.0

[1] Nominal output = 40 W. Due to build-up of heat, not more than 20 W may be withdrawn.
[2] Installed in expansion cabinet ECR S30777-U711-E901

> You must check whether the total power requirement of the boards used and the connected workpoint clients exceeds the maximum possible output of the UPSC-DR with or without EPSU2-R. A sample calculation is shown in Section D.8.

Table D-12 HiPath 3300 Board Power Requirement

Board or Component	**Part Number**	**Net Power Requirement in W**	
		5 V	**–48 V**
BS3/1	S30807-H5482-X	–	2.0
BS3/3	S30807-H5485-X	–	3.0
CBRC (including submodules)	S30810-Q2935-Z301	7.0	0.5
HXGR3	S30810-K2943-Z	10.0	–
IVMP8R	S30122-K7379-Z100	2.6	0.3
Fan for HiPath 3300	–	–	1.4
PDM1	S30807-Q5692-X100	–	5.0
SLU8R	S30817-K922-Z301	0.8	–
STLS4R	S30817-K924-Z313	1.0	–
STRBR	S30817-Q932-Z	0.5	–
TLA4R	S30817-Q923-Zxxx	0.2	–
TMGL4R	S30810-K2918-Z	5.7[1]	0.1[1]
8SLAR	S30810-K2925-Z	1.3	1.3

[1] Identified at a traffic flow of 0.8 Erlang

D.7 Workpoint Clients, Key Modules and Adapter Power Requirements

An average power requirement is specified, which is identified at a traffic flow of 0.15 Erlang.

Table D-13 Workpoint Clients, Key Modules and Adapter Power Requirements

Workpoint Client		Net Power Requirement in W (from –48 V input)
optiPoint 410 optiPoint 420	optiPoint 410 entry	0.0[1]
	optiPoint 410 economy	
	optiPoint 410 standard	
	optiPoint 410 advance	
	optiPoint 420 economy	
	optiPoint 420 economy plus	
	optiPoint 420 standard	
	optiPoint 420 advance	
	optiPoint SLK Module	
	optiPoint 410 Display Module	
optiPoint 500	optiPoint 500 entry	0.3
	optiPoint 500 economy (not for U.S.)	0.7
	optiPoint 500 basic	0.7
	optiPoint 500 standard, optiPoint 500 standard SL (For U.S. Only)	0.7
	optiPoint 500 advance	0.72
	optiPoint Key Module	0.05
	optiPoint BLF	0.0[2]
	optiPoint Analog Adapter	0.00[3]
	optiPoint ISDN Adapter	0.7
	optiPoint Phone Adapter	0.18
	optiPoint Acoustic Adapter	0.25
	optiPoint Recorder Adapter	0.3
optiPoint 600 office		0.0[2]

Table D-13 Workpoint Clients, Key Modules and Adapter Power Requirements

Workpoint Client		**Net Power Requirement in W (from –48 V input)**
optiset E	optiset E entry	0.36
	optiset E basic	0.36
	optiset E standard	0.41
	optiset E advance plus/comfort	0.43
	optiset E advance conference/conference	0.85
	optiset E memory	0.56
	optiset E key Module	0.06
	Hicom Attendant BLF	0.0[2]
	optiset E acoustic adapter	0.02
	optiset E analog adapter	0.0[3]
	optiset E contact adapter	0.7
	optiset E control adapters	0.34
	optiset E data adapter	0.76
	optiset E headset adapter	0.03
	optiset E headset plus adapter	0.23
	optiset E ISDN adapter	0.05
	optiset E phone adapter	0.06
Analog telephone (40 mA for short trunk) in active status		0.3

[1] A local power supply is used for Power over LAN (in accordance with Cisco and the pre802.3af standard) and power supply.

[2] Power is provided by a local power supply.

[3] A local power supply provides power to the connected analog telephone.

D.8 Checking Whether the Output of a Power Supply Unit is Sufficient

Apart from the secondary power requirements, the power output must also be checked to ensure that the maximum possible output of the system's power supply unit is sufficient. For this, the power requirement on the 5-V output format and on the –48-V output format must be examined separately.

A separate calculation must be performed for every HiPath 3750 and HiPath 3700 system cabinet (in other words for every UPSM).

> **Caution**
> To guarantee smooth system operation, the nominal output of the power supply unit at the 5-V output and at the –48-V output must be greater than the respective secondary power requirement.

Procedure

Proceed as follows to identify the secondary power requirement of a system:

1. Determine secondary power requirement at the 5-V output

   5 V power requirement of the boards/components used

   = secondary power requirement at the 5-V output

2. Determine secondary power requirement at the –48-V output

   –48 V power requirement of the boards/components used

   + power requirement of connected workpoint clients (analog and digital telephones), key modules and adapters

   ---

   = secondary power requirement at the –48-V output

Using the specified values, check whether the total power requirement exceeds the maximum possible output of the power supply unit at the 5-V output or at the –48-V output. If this is the case, you have the following options:

- HiPath 3800
  The number of LUNA2 power supply units can be increased.
- HiPath 3750 and HiPath 3700 with UPSM
  For multiple cabinet systems, the distribution of boards on the system cabinets can be optimized. Please observe the configuration notes in Section 4.3.6.

- HiPath 3550 with USPSC-D
The maximum nominal output at the –48-V output can be increased from 53 W to 140 W by using the EPSU2 external power supply unit.
- HiPath 3350 with USPSC-D
Due to build-up of heat, the 5-V output format can only be loaded with a maximum of 20 W. A maximum nominal output of 40 W is possible by using the EPSU2external power supply unit. In addition, the maximum nominal output of the –48-V output increases from 53 W to 140 W.
- HiPath 3500 with UPSC-DR
The maximum nominal output of the –48-V output can be increased from 53 W to 140 W by using the EPSU2-R external power supply unit.
- HiPath 3300 with USPSC-DR
Due to build-up of heat, the 5-V output format can only be loaded with a maximum of 20 W. A maximum nominal output of 40 W is possible by using the EPSU2-R external power supply unit. In addition, the maximum nominal output of the –48-V output increases from 53 W to 140 W.

Sample calculation for a HiPath 3550

1. Determine secondary power requirement at the 5-V output

	power requirements of the boards/ components used =	7.00 W	1 x CBCC
		10.00 W	1 x HXGS3 (including ventilator kit)
		0.90 W	1 x TS2
		2.40 W	3 x SLU8
		1.30 W	1 x 8SLA
		5.00 W	1 x SLC16N
		0.00 W	12 x BS3/1
=	secondary power requirement at the 5-V output =	26.60 W	

The maximum nominal output of UPSC-D at the 5-V output amounts to 40 W and is enough to cover the specified power requirement.

2. Determine secondary power requirement at the –48-V output

	power requirements of the boards/ components used =	0.50 W	1 x CBCC
		2.80 W	1 x HXGS3 (including ventilator kit)
		0.00 W	1 x TS2
		0.00 W	3 x SLU8
		1.30 W	1 x 8SLA
		0.00 W	1 x SLC16N
		24.00 W	12 x BS3/1
+	power requirement of connected workpoint clients, key modules and adapters =	0.56 W	1 x optiset E memory
		4.32 W	6 x optiPoint 500 advance
		0.85 W	1 x optiset E advance conference/conference
		8.40 W	12 x optiPoint 500 basic
		2.40 W	8 x optiPoint 500 entry
		0.00 W	2 x Hicom Attendant BLF
		0.00 W	2 x optiPoint BLF
		0.40 W	8 x optiPoint key module
		0.50 W	2 x optiPoint acoustic adapter
		1.80 W	6 x analog telephones
=	secondary power requirement at the –48-V output =	47.83 W	

The maximum nominal output of UPSC-D at the –48-V output amounts to 53 W and is enough to cover the specified power requirement.

D.9 Identifying the Primary System Power Requirement

Procedure

Proceed as follows to identify the primary power requirement of a system:

1. Determine overall secondary power requirement

   power requirements of the boards/components used

   + power requirement of connected workpoint clients (analog and digital telephones), key modules and adapters

   ---

   = overall secondary power requirement

2. Identifying primary power requirement

   overall secondary power requirement

   + requirements of power supply units (UPSM = 30 W, PSUP/UPSC-D/UPSC-DR = 12 W respectively)

   + requirements of EPSU2/EPSU2R (10 W respectively)

   = the result should be multiplied by the factor 1.2 to allow for the degree of efficiency of the power supply.

Sample calculation for a HiPath 3550

1. Determine overall secondary power requirement

	power requirements of the boards/ components used =	7.50 W	1 x CBCC
		12.80 W	1 x HXGS3 (including ventilator kit)
		0.90 W	1 x TS2
		2.40 W	3 x SLU8
		2.60 W	1 x 8SLA
		5.00 W	1 x SLC16N
		24.00 W	12 x BS3/1
+	power requirement of connected workpoint clients, key modules and adapters =	0.56 W	1 x optiset E memory
		4.32 W	6 x optiPoint 500 advance
		0.85 W	1 x optiset E advance conference/conference
		8.40 W	12 x optiPoint 500 basic
		2.40 W	8 x optiPoint 500 entry
		0.00 W	2 x Hicom Attendant BLF
		0.00 W	2 x optiPoint BLF
		0.40 W	8 x optiPoint key module
		0.50 W	2 x optiPoint acoustic adapter
		1.80 W	6 x analog workpoint clients
=	overall secondary power requirement =	74.43 W	

2. Identifying primary power requirement

	overall secondary power requirement =	74.43 W	
+	UPSC-D requirement =	12.00 W	
	Allow for the degree of efficiency of the power supply unit:	86.43 W	x 1.2 = 103.7 W

The primary power requirement of HiPath 3550 with the expansion mentioned amounts to approximately 103.7 W.

Figures

Figure 2-1 HiPath 3800 Dimensions 2-4
Figure 2-2 HiPath 3750 Dimensions 2-6
Figure 2-3 HiPath 3550 Dimensions 2-7
Figure 2-4 HiPath 3350 Dimensions 2-8
Figure 2-5 HiPath 3700 Dimensions 2-9
Figure 2-6 HiPath 3500 Dimensions 2-10
Figure 2-7 HiPath 3300 Dimensions 2-11
Figure 2-8 HiPath 5000 Multi-Node IP System 2-20
Figure 3-1 CBCC Board (S30810-Q2935-A301) 3-20
Figure 3-2 CBRC Board (S30810-Q2935-Z301) 3-27
Figure 3-3 CBCPR Board (S30810-Q2936-X) 3-33
Figure 3-4 CBSAP Board (S30810-Q2314-X) 3-36
Figure 3-5 CBSAP - Front Panel 3-37
Figure 3-6 CMA with Spacing Bolts 3-39
Figure 3-7 Networking Options for HiPath 3000 Systems 3-40
Figure 3-8 CR8N (S30810-Q2513-X100) 3-45
Figure 3-9 CUC Backplane (S30777-Q750-X) 3-46
Figure 3-10 CUCR Backplane (S30777-Q750-Z) 3-46
Figure 3-11 CUP Backplane (S30777-Q751-X) 3-47
Figure 3-12 CUPR Backplane (S30777-Q751-Z) 3-47
Figure 3-13 DBSAP (S30807-Q6722-X) 3-48
Figure 3-14 DBSAP on the Backplane of the Expansion Cabinet 3-49
Figure 3-15 LIM in HiPath 3750 and HiPath 3700 - Procedure for LAN Connection 3-52
Figure 3-16 LIM in HiPath 3750 and HiPath 3700 - Adapter Cable (C39195-Z7213-A1) 3-52
Figure 3-17 LIM in HiPath 3750 and HiPath 3700 - Attachment of the Patch Cable to the Backplane Grill 3-53
Figure 3-18 CBSAP with LIMS Module Plugged In 3-54
Figure 3-19 LUNA2 Front Panel 3-58
Figure 3-20 LUNA2 Slots in the Basic Cabinet (With Outer Panel Mounted) 3-60
Figure 3-21 LUNA2 Slots in the Expansion Cabinet (With Outer Panel Mounted) . . . 3-61
Figure 3-22 Rear View of the BSG 48/38 Battery Cabinet (S30122-K5950-F300) . . . 3-63
Figure 3-23 Connections Between the BSG 48/38 Battery Cabinet and HiPath 3800 3-64
Figure 3-24 PSUP Interface (S30122-K5658-M) 3-67
Figure 3-25 UPSC-D (S30122-K5660-M300) 3-70
Figure 3-26 UPSC-D (S30122-K5660-M300) 3-70
Figure 3-27 UPSC-D - Switches and LEDs 3-71
Figure 3-28 UPSC-D - Connectors 3-72

Figure 3-29 UPSC-DR (S30122-K7373-M900) 3-75
Figure 3-30 UPSC-DR (S30122-K7373-M900) 3-76
Figure 3-31 UPSC-DR - Switches and LEDs. 3-77
Figure 3-32 UPSC-DR - Connectors 3-78
Figure 3-33 Front and Rear Views of the UPSM (S30122-K5950-S100) 3-82
Figure 3-34 Front and Rear Views of the UPSM (S30122-K5950-A100) 3-83
Figure 3-35 Rear View of the BSG 48/38 Battery Cabinet (S30122-K5950-F300) . . . 3-84
Figure 3-36 Connections between the BSG 48/38 Battery Cabinet and UPSM (HiPath 3750, HiPath 3700) 3-85
Figure 3-37 DIU2U Adapter Cable C39195-A7269-B625 (for U.S. only). 3-87
Figure 3-38 DIU2U (for U.S. only) - Front Panel (S30810-Q2216-X) 3-88
Figure 3-39 DIUN2 - Front Panel (S30810-Q2196-X) 3-91
Figure 3-40 HXGM3 (S30810-Q2942-X) 3-95
Figure 3-41 HXGM3 - Interfaces 3-96
Figure 3-42 HXGM3 LAN Adapter Connector for Backplane 3-98
Figure 3-43 HXGM3 LAN Adapter Cable for Backplane (for U.S. only). 3-99
Figure 3-44 HXGS3 (S30810-Q2943-X) 3-102
Figure 3-45 HXGR3 (S30810-K2943-Z) 3-102
Figure 3-46 HXGS3/HXGR3 - Interfaces. 3-103
Figure 3-47 HXGS3 - Installation of the Fan Kit in HiPath 3550 3-107
Figure 3-48 HXGS3 - Securing Clips for Fan Kit 3-108
Figure 3-49 HXGS3 - Connection of the Fan Kit 3-108
Figure 3-50 IVML8 and IVML24 - Packing Protection Covering 3-110
Figure 3-51 IVML8, IVML24 (S30122-X7380-X100, -X) 3-111
Figure 3-52 LAN Adapter (SIPAC 1 SU - RJ45) 3-113
Figure 3-53 IVMNL/IVMN8 - Packing Protection Covering 3-115
Figure 3-54 IVMNL/IVMN8 - Front Panel (S30122-H7688-X -X100). 3-116
Figure 3-55 IVMP8 and IVMP8R (not for U.S.) - Packing Protection Covering 3-120
Figure 3-56 IVMP8, IVMP8R (S30122-Q7379-X100, -K7379-Z100) (not for U.S.). 3-121
Figure 3-57 IVMS8 and IVMS8R - Packing Protection Covering. 3-125
Figure 3-58 IVMS8 and IVMS8R (S30122-Q7379-X, -K7379-Z). 3-126
Figure 3-59 IVMS8R - Front View (S30122-K7379-Z). 3-127
Figure 3-60 PBXXX (S30810-Q6401-X) Front Panel 3-130
Figure 3-61 SLA8N (not for U.S.), SLA16N, SLA24N (S30810-Q2929-X200, -X100, -X) 3-132
Figure 3-62 SLC16 (S30810-Q2922-X) (Not for U.S.) 3-140
Figure 3-63 SLC16N (S30810-Q2193-X100) (Not for U.S.) 3-140
Figure 3-64 Base Station Power Supply via One $U_{P0/E}$ Interface (Not for U.S.) 3-148
Figure 3-65 Base Station Power Supply via Two $U_{P0/E}$ Interfaces (Not for U.S.) . . . 3-149
Figure 3-66 BS3/3 Power Supply via Three $U_{P0/E}$ Interfaces (Not for U.S.) 3-150
Figure 3-67 EPSU2 - Indicators and Ports. 3-152
Figure 3-68 EPSU2 - Holes for Mounting on the Wall 3-155
Figure 3-69 SLCN (S30810-Q2193-X300) - LEDs on the Front Panel 3-156

Figure 3-70 SLMA/SLMA8 - LEDs on the Front Panel 3-163
Figure 3-71 SLMO2/SLMO8 - LEDs on the Front Panel 3-173
Figure 3-72 SLMO8 (Not for U.S.), SLMO24 (S30810-Q2901-X100, S30810-Q2901-X) 3-183
Figure 3-73 SLU8 Interfaces (S30817-Q922-A301) 3-189
Figure 3-74 SLU8R Interfaces (S30817-K922-Z301) 3-190
Figure 3-75 STLS2 (Not for U.S.), STLS4 Interfaces (S30817-Q924-B313, -A313) 3-191
Figure 3-76 Sample Pin Assignments in MW Jacks (Not for U.S.). 3-194
Figure 3-77 Wiring and Ranges for S_0 Bus Jacks (Not for U.S.) 3-195
Figure 3-78 MWxx Jack Pin Assignment (For U.S. Only). 3-196
Figure 3-79 S_0 Bus Wiring from STLS4 Port or optiset E ISDN Adapter (For U.S. Only) 3-197
Figure 3-80 STLS4R Interfaces (S30817-K924-Z313) 3-198
Figure 3-81 STLSX2/STLSX4/STLSX4R - Interfaces 3-201
Figure 3-82 Pin Assignments in MW Jacks 3-203
Figure 3-83 Wiring and Ranges for S_0 Bus Jacks 3-204
Figure 3-84 STMD3 (S30810-Q2217-X10/-X110) - LEDs on the Front Panel 3-205
Figure 3-85 STMD8 (S30810-Q2558-X200). 3-211
Figure 3-86 S_0 Trunk Connection (Example for HiPath 3750) 3-213
Figure 3-87 S_0 NT Connection(Not for U.S.) 3-213
Figure 3-88 S_0 Networking Options (Not for U.S.) (Examples for HiPath 3750). . . . 3-215
Figure 3-89 S_0 Bus to the STMD8 over the MDFU or MDFU-E (Not for U.S.) 3-216
Figure 3-90 Pin Assignments in MW Jacks 3-216
Figure 3-91 S_0 Bus - Example of Jack Assignment (Not for U.S.) 3-217
Figure 3-92 STMD8 - S0 Bus Wiring from STMD8 Port or from ISDN Adapter (for U.S. only) 3-220
Figure 3-93 STMI2 (S30810-Q2316-X100) - HGA Slots 3-222
Figure 3-94 STMI2 - Front Panel 3-224
Figure 3-95 TIEL (S30810-Q2520-X) 3-230
Figure 3-96 E&M Interface Type 1 (Not for U.S.) 3-232
Figure 3-97 E&M Interface Type 1A (Not for U.S.). 3-233
Figure 3-98 E&M Interface Type 1B or 5 (Not for U.S.) 3-234
Figure 3-99 E&M Interface Type 2 (Not for U.S) 3-235
Figure 3-100 E&M Interface Type 2 - Circuit Diagram, MDFU or MDFU-E Numbering (Not for U.S.). 3-236
Figure 3-101 TLA2, TLA4 (Not for U.S.) - Interfaces (S30817-Q923-Bxxx, -Axxx) . . 3-242
Figure 3-102 TLA8 (Not for U.S.) - Interfaces (S30817-Q926-Axxx) 3-243
Figure 3-103 TLA4R (Not for U.S.) Interfaces (S30817-Q923-Zxxx) 3-244
Figure 3-104 TM2LP - Front Panel (S30810-Q2159-Xxxx) 3-246
Figure 3-105 TMAMF (S30810-Q2587-Axxx). 3-253
Figure 3-106 Pin Assignments of the TMAMF Diagnostic Cable 3-254
Figure 3-107 TMC16 (for U.S. only) (S30810-Q2485-X) - Front Panel 3-257
Figure 3-108 TMCAS (S30810-Q2938-X) 3-262

Figure 3-109 TMCAS in HiPath 3750 and HiPath 3700 - Backplane View of the “8-Slot” Basic Cabinet. 3-266
Figure 3-110 TMCAS in HiPath 3550 3-267
Figure 3-111 TMDID (for U.S. only) (S30810-Q2452-X) - Front Panel 3-273
Figure 3-112 TMDID8 (for U.S. only) (S30810-Q2507-X) 3-277
Figure 3-113 TMEW2 - Front Panel (S30810-Q2292-X100) 3-281
Figure 3-114 TMGL4 (For U.S. Only) - Interfaces (S30810-Q2918-X) 3-284
Figure 3-115 TMGL4R (for U.S. only) (S30810-K2918-Z) 3-286
Figure 3-116 TMGL8 (for U.S. only) (S30810-K2703-Z) 3-288
Figure 3-117 TML8W (Not for U.S.) (S30817-Q626-Axxx, -Bxxx). 3-290
Figure 3-118 TMQ4 (for U.S. only) (S30810-Q2917-X) 3-293
Figure 3-119 TMST1 (for U.S. only) (S30810-Q2920-X) 3-295
Figure 3-120 TMST1 Adapter (SIPAC 1 SU - MW8 (RJ48C)) C39228-A7195-A12 (for U.S. only) 3-297
Figure 3-121 TMS2 (Not for U.S) (S30810-Q2915-X) 3-298
Figure 3-122 S_{2M} trunk connection 3-301
Figure 3-123 Supplying NTs via S_{2M} 3-302
Figure 3-124 S_{2M} - NT Connection (Not for U.S.) 3-302
Figure 3-125 S_{2M} Connection to Deutsche Telekom NT (For Germany Only) 3-303
Figure 3-126 S_{2M} Networking Options (Not for U.S.). 3-304
Figure 3-127 TST1 (For U.S. Only) (S30810-Q2919-X/S30810-K2919-Z) 3-305
Figure 3-128 TS2 (Not for U.S.) - Interfaces (S30810-Q2913-X100, -X300) 3-308
Figure 3-129 TS2R (Not for U.S.) - Interfaces (S30810-K2913-Z100, -Z300) 3-308
Figure 3-130 S_{2M} Trunk Connection 3-310
Figure 3-131 S_{2M} - NT Connections for Spain and Portugal 3-311
Figure 3-132 4SLA (Not for U.S.), 8SLA - Interfaces (S30810-Q2923-X200, -X100). 3-312
Figure 3-133 16SLA (Not for U.S.) - Interfaces (S30810-Q2923-X) 3-313
Figure 3-134 8SLAR Interfaces (S30810-K2925-Z). 3-315
Figure 3-135 ALUM4 - Function. 3-317
Figure 3-136 ALUM4 - Interfaces (S30817-Q935-A) 3-318
Figure 3-137 ALUM4 - Basic Structure 3-320
Figure 3-138 AMOM - Connection to DIUN2 and DIU2U 3-321
Figure 3-139 ANI4 (For Selected Countries Only) - Interfaces (S30807-Q6917-Axxx) 3-323
Figure 3-140 ANI4 (For Selected Countries Only) - Installation Steps 3-326
Figure 3-141 ANI4R (for selected countries only) (S30807-Q6917-Z103) 3-327
Figure 3-142 EXM Slot for HiPath 3550 and HiPath 3350 Wall Housing. 3-330
Figure 3-143 EXMR Connection to HiPath 3500 and HiPath 3300 3-331
Figure 3-144 EVM (S30807-Q6945-X) - Interfaces 3-333
Figure 3-145 EXMNA (For U.S. Only) (S30807-Q6923-X) 3-334
Figure 3-146 EXMNA (for U.S. only) - Slot for HiPath 3550 and HiPath 3350 3-334
Figure 3-147 GEE8 (Not for U.S.) (S30817-Q664-xxxx) 3-336

Figure 3-148 GEE12, GEE16, GEE50 (Not for U.S.) - Interfaces (S30817-Q951-Axxx) . . . 3-337
Figure 3-149 HOPE (For U.S. Only) (S30122-Q7078-X; S30122-Q7079-X) . . . 3-339
Figure 3-150 OPAL (C39195-A7001-B130) . . . 3-341
Figure 3-151 OPALR (C39195-A7001-B142) . . . 3-342
Figure 3-152 ALUM Using PFT1/PFT4 (Not for U.S.) . . . 3-343
Figure 3-153 Installation Location of PFT1 and PFT4 (MDFU/MDFU-E) (Not for U.S.) . . . 3-344
Figure 3-154 PFT1 (S30777-Q539-X) and PFT4 (S30777-Q540-X) Board Assignment . . . 3-345
Figure 3-155 Installation Location of the REAL Board . . . 3-347
Figure 3-156 REAL - Relay Contacts (De-Energized) and MDFU Interfaces . . . 3-348
Figure 3-157 REALS (S30807-Q6629-X) . . . 3-351
Figure 3-158 REALS Slots in the Basic Cabinet (With Outer Panel Mounted) . . . 3-352
Figure 3-159 STBG4 (For France Only) - Interfaces (S30817-Q934-A) . . . 3-355
Figure 3-160 STRB Interfaces (S30817-Q932-A) . . . 3-357
Figure 3-161 STRBR Interfaces (S30817-Q932-Z) . . . 3-357
Figure 3-162 STRB and STRBR Board Relay and Sensor Functions . . . 3-358
Figure 3-163 V24/1 (Not for U.S.) (S30807-Q6916-X100) . . . 3-361
Figure 3-164 HiPath 3550 and HiPath 3350 - V.24 Connections . . . 3-361
Figure 3-165 V.24 (RS-232) Connector Assignment, HiPath 3550 and HiPath 3350 . . . 3-362
Figure 3-166 V.24 Cable Assignment (C30267-Z355-A25) . . . 3-364
Figure 4-1 HiPath 3800 - Setting Up the Basic Cabinet . . . 4-9
Figure 4-2 HiPath 3800 - Positioning the Cabinet Feet . . . 4-11
Figure 4-3 HiPath 3800 - Installing a Stacked Two-Cabinet System (Rear View) . . . 4-12
Figure 4-4 HiPath 3800 - Installing a Two-Cabinet System Side by Side (Rear View) . . . 4-14
Figure 4-5 HiPath 3800 - Grounding the System Cabinets and Main Distribution Frame (nor for U.S.) . . . 4-16
Figure 4-6 HiPath 3800 - Grounding Option 1a (not for USA) . . . 4-17
Figure 4-7 HiPath 3800 - Grounding Option 1b (not for USA) . . . 4-17
Figure 4-8 HiPath 3800 - Earth ground connection (for U.S. only) . . . 4-19
Figure 4-9 HiPath 3800 - System Cabinet with Plastic Cover . . . 4-22
Figure 4-10 HiPath 3800 - Installation Examples in the 19-Inch Cabinet . . . 4-23
Figure 4-11 HiPath 3800 - Removing Cabinet Feet . . . 4-26
Figure 4-12 HiPath 3800 - Installing System Cabinets in 19-Inch Cabinet . . . 4-27
Figure 4-13 HiPath 3800- Grounding the Systems and Patch Panels in a 19-Inch Cabinet . . . 4-29
Figure 4-14 HiPath 3800 - Board Slots in the Basic Cabinet . . . 4-32
Figure 4-15 HiPath 3800 - Board Slots in the Expansion Cabinet . . . 4-33
Figure 4-16 HiPath 3800 - Removing/Inserting the Board Using the Board Wrench . . . 4-35

Figure 4-17 Installing the Board Shielding Cover 4-35
Figure 4-18 HiPath 3800 - Installing the LUNA2 Power Supply Unit 4-36
Figure 4-19 HiPath 3800 - Slots for LUNA2 and REALS in the Basic Cabinet (With Outer Panel Mounted) 4-37
Figure 4-20 HiPath 3800 - Slots for LUNA2 in the Expansion Cabinet (With Outer Panel Mounted). 4-37
Figure 4-21 HiPath 3800 - Installing the REALS Board. 4-38
Figure 4-22 SIVAPAC-SIPAC Board Adapter 4-41
Figure 4-23 Installing the SIVAPAC-SIPAC Board Adapter. 4-42
Figure 4-24 Replacing the Board Lock 4-43
Figure 4-25 HiPath 3800 - Initialization of Subscriber Line Circuits and Ports 4-44
Figure 4-26 HiPath 3800 - PCM Highways in the Basic Cabinet 4-45
Figure 4-27 HiPath 3800 - PCM Highways in the Expansion Cabinet 4-46
Figure 4-28 HiPath 3800 - Backplane (S30804-Q5392-X) of the Basic Cabinet 4-50
Figure 4-29 HiPath 3800 - Connectors and Jacks on the Backplane of the Basic Cabinet 4-51
Figure 4-30 HiPath 3800 - Expansion Cabinet Backplane (S30804-Q5393-X) 4-53
Figure 4-31 HiPath 3800 - Connectors and Jacks on the Backplane of the Expansion Cabinet 4-54
Figure 4-32 HiPath 3800 - Backplane of the Basic Cabinet with Mounted Filler Panels 4-58
Figure 4-33 HiPath 3800 - connector panels with RJ45 Jacks 4-59
Figure 4-34 HiPath 3800 - Connector Panel with CHAMP Jack (for U.S. only) 4-61
Figure 4-35 HiPath 3800 - Connector Panel with Two SIPAC 1 SU Connectors (S30807-Q6631-X) 4-62
Figure 4-36 MDFU-E - Layout and Dimensions (669.0 x 328.8 x 125.4 mm) 4-65
Figure 4-37 Assignment (Numbering) of the Splitting/Jumper Strips (view from above) 4-67
Figure 4-38 Stripping an Open-End Cable for the MDFU-E 4-68
Figure 4-39 Patch Panel S30807-K6143-X 4-70
Figure 4-40 Installing the External Patch Panel in the 19-Inch Cabinet. 4-71
Figure 4-41 Layout of the Patch Panel S30807-K6143-X for Different Peripheral Boards. 4-72
Figure 4-42 Assignment of Patch Panel S30807-K6143-X 4-73
Figure 4-43 S_0 Patch Panel C39104-Z7001-B3. 4-74
Figure 4-44 Installing the External S_0 Patch Panel in the 19-Inch Cabinet 4-75
Figure 4-45 Assignment of the S_0 Patch Panel C39104-Z7001-B3. 4-76
Figure 4-46 Laying Wire Pairs at the S_0 Patch Panel 4-76
Figure 4-47 Stripping the Open-End Cable for the S_0 Patch Panel. 4-77
Figure 4-48 HiPath 3750 - Removing the Front and Rear Covers. 4-92
Figure 4-49 HiPath 3750 - Wall-Mount Kit (for U.S. only) 4-93
Figure 4-50 HiPath 3750 Mounting a One-Cabinet System on the Wall (for U.S. only) 4-94
Figure 4-51 HiPath 3750 - Installing a Two-Cabinet System (Stacked). 4-96

Figure 4-52 HiPath 3750 - Mounting the Stabilizer Feet (Three-Cabinet System Shown) 4-97
Figure 4-53 HiPath 3750 - Wall-Mount Kit (for U.S. only) 4-98
Figure 4-54 HiPath 3750 Wall Mounting for a Stacked Two-Cabinet System (for U.S. only) 4-99
Figure 4-55 HiPath 3750 - Installing a Two-Cabinet System (Side By Side) 4-101
Figure 4-56 HiPath 3750 - Installing a Three-Cabinet System (Stacked) 4-103
Figure 4-57 HiPath 3750 Seismic Anchors (for U.S. only) 4-104
Figure 4-58 HiPath 3750 Seismic Anchoring for Multiple Cabinets (Front View) (for U.S. only) 4-105
Figure 4-59 HiPath 3750 - Grounding the System Cabinets and Main Distribution Frame (not for U.S.) 4-107
Figure 4-60 HiPath 3750 - Grounding Option 1a (not for USA) 4-108
Figure 4-61 HiPath 3750 - Grounding Option 1b (not for USA) 4-108
Figure 4-62 HiPath 3750 - Grounding connector for Basic Cabinet (for U.S. only) 4-110
Figure 4-63 HiPath 3750 - Backplane on the “8-Slot” Basic Cabinet 4-112
Figure 4-64 HiPath 3750 - Backplane on the “8-Slot” Expansion Cabinets 4-113
Figure 4-65 Two-Cabinet “8-Slot” System - Connection Cables between BC and EC1 4-115
Figure 4-66 Three-Cabinet “8-Slot” System - Connection Cables between BC, EC1 and EC2 4-116
Figure 4-67 S_{2M} Adapter (SIPAC 1 SU - MW8 (RJ48C)) C39228-A7195-A12 4-119
Figure 4-68 Stripping an Open-End Cable (not for the U.S.) 4-120
Figure 4-69 Assignment (Numbering) of the Splitting/Jumper Strips, (view from above) (not for U.S.) 4-123
Figure 4-70 MDFU - Layout and Dimensions (367.0 x 328.8 x 125.4 mm) (not for U.S.) 4-124
Figure 4-71 MDFU-E - Layout and Dimensions (669.0 x 328.8 x 125.4 mm) (not for U.S.) 4-125
Figure 4-72 HiPath 3700 - Removing the Front and Rear Covers 4-130
Figure 4-73 HiPath 3700 - Installation in the 19-Inch Cabinet 4-132
Figure 4-74 HiPath 3700 - Mounting the Patch Panel 4-133
Figure 4-75 HiPath 3700- Grounding the Systems and Patch Panels in a 19-Inch Cabinet 4-135
Figure 4-76 HiPath 3700 - Backplane on the “8-Slot” Basic Cabinet 4-137
Figure 4-77 HiPath 3700 - Backplane on the “8-Slot” Expansion Cabinets 4-138
Figure 4-78 Two-Cabinet “8-Slot” System - Connection Cables between BC and EC1 4-140
Figure 4-79 Three-Cabinet “8-Slot” System - Connection Cables between BC, EC1 and EC2 4-141
Figure 4-80 Patch Panel S30807-K6143-X 4-144
Figure 4-81 Structure of the Patch Panel S30807-K6143-X 4-145
Figure 4-82 S_0 Patch Panel C39104-Z7001-B3 4-146

Figure 4-83 Laying Wire Pairs at the S_0 Patch Panel 4-147
Figure 4-84 Stripping the Open-End Cable for the S_0 Patch Panel. 4-148
Figure 4-85 S_{2M} Adapter (SIPAC 1 SU - MW8 (RJ48C)) C39228-A7195-A12 4-149
Figure 4-86 Layout of the Patch Panel S30807-K6143-X for Different Peripheral Boards. 4-150
Figure 4-87 Slot Numbers and Widths in “8-Slot” BC, EC1, and EC2 4-153
Figure 4-88 HiPath 3750 and HiPath 3700 - Initialization of Subscriber Line Circuits and Ports 4-155
Figure 4-89 PCM Segments for a One-Cabinet System 4-157
Figure 4-90 PCM Segments for a Two-Cabinet System 4-158
Figure 4-91 PCM Segments for a Three-Cabinet System 4-158
Figure 4-92 Locking and unlocking boards 4-160
Figure 4-93 HiPath 3550 and HiPath 3350 - Space Requirements (for U.S. only) 4-166
Figure 4-94 MDFU - Layout and Dimensions (367.0 x 328.8 x 125.4 mm) (not for U.S.) 4-169
Figure 4-95 HiPath 3550 and HiPath 3350 - Wall Attachment. 4-172
Figure 4-96 HiPath 3550 and HiPath 3350 - Wall Attachment. 4-172
Figure 4-97 HiPath 3550, HiPath 3350 - Grounding an External Main Distribution Frame 4-174
Figure 4-98 Layout of CABLU S30269-Z41-A30 (Length = 3 m). 4-176
Figure 4-99 HiPath 3550 - Backplane Connection for a Peripheral Board in HiPath 3750 Format 4-177
Figure 4-100 Integrated Distribution Frame - Slip-On Connector Screw Connections 4-178
Figure 4-101 HiPath 3550 and HiPath 3350 - Power Cable with Ferrite Sleeve 4-179
Figure 4-102 HiPath 3550 - Wall Housing System Overview 4-181
Figure 4-103 HiPath 3550 - Slots in the Wall Housing. 4-182
Figure 4-104 HiPath 3550 - Option Adapter Long (OPAL) 4-182
Figure 4-105 HiPath 3350 - Wall Housing System Overview 4-183
Figure 4-106 HiPath 3350 - Slots in the Wall Housing. 4-183
Figure 4-107 HiPath 3500 and HiPath 3300 - Wall Installation (for U.S.) 4-189
Figure 4-108 HiPath 3500 and HiPath 3300 - Mounting the 19-Inch Cabinet 4-191
Figure 4-109 HiPath 3500 and HiPath 3300 - Grounding 4-193
Figure 4-110 HiPath 3500 and HiPath 3300 - Connection Cable to ECR 4-194
Figure 4-111 HiPath 3500 - Slot Levels in the 19-Inch Housing 4-195
Figure 4-112 HiPath 3300 - Slot Levels in the 19-Inch Housing 4-196
Figure 6-1 HiPath 5000 Multi-Node IP System 6-4
Figure 6-2 Customer Data Exchange Between the Feature Server and Nodes 6-5
Figure 6-3 Feature Server Services and Routines. 6-6
Figure 6-4 P 500 UPS - Front and Rear Panel 6-59
Figure 8-1 Licensing Process with Central License Server (CLS) 8-3
Figure 8-2 Distribution of Licenses with HiPath 3000 Manager E 8-8

Figure 8-3 Procedure for Licensing optiClient Attendant V7.0 on HiPath 3000 V5.0 8-26
Figure 8-4 Procedure for Licensing optiClient Attendant V7.0 on HiPath 3000 < V5.0 8-28
Figure 8-5 Licensing procedure when upgrading optiClient Attendant V6.0 –> V7.0 on HiPath 3000 V5.0 8-30
Figure 8-6 Procedure for Licensing when Upgrading optiClient Attendant V6.0 –> V7.0 on HiPath 3000 < V5.0 8-32
Figure 8-7 Changing Licenses on an optiClient Attendant V7.0 As Part of an Upgrade to HiPath 3000 V5.0 8-34
Figure 9-1 Sample Connection of a CDR Printer to HiPath 3000. 9-6
Figure 9-2 ECR Front Panel (155 x 440 x 380 mm) 9-9
Figure 9-3 ECR Rear Panel With Connecting Elements 9-10
Figure 9-4 HiPath 3700, HiPath 3500, HiPath 3300 - ECR With Batteries. 9-13
Figure 9-5 ECR With Built-In Batteries 9-14
Figure 9-6 HiPath 3500, HiPath 3300 - ECR With Batteries and EPSU2-R 9-19
Figure 9-7 ECR with Built-In EPSU2-R. 9-20
Figure 9-8 Connecting the Fan to the EPSU2-R 9-22
Figure 9-9 Placement of the Fan in the ECR 9-23
Figure 9-10 Connection Options for Entrance Telephones 9-24
Figure 9-11 Direct Connection of Entrance Telephones. 9-24
Figure 9-12 Connecting DoorCom Analog to HiPath 3000. 9-25
Figure 9-13 Connecting Speakers to an Analog Station Port. 9-27
Figure 9-14 Connecting Speakers to an Analog Trunk Port. 9-28
Figure 9-15 Differences Between V4.0 and V5.0 Configurations 9-31
Figure 9-16 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 1 of 4) 9-32
Figure 9-17 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 2 of 4) 9-33
Figure 9-18 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 3 of 4) 9-34
Figure 9-19 Flowchart for CDB Conversion from V4.0 –> V5.0 (Part 4 of 4) 9-35
Figure 10-1 optiPoint 500 entry - Standard Key Assignment (Default). 10-5
Figure 10-2 optiPoint 500 economy (not for U.S.) - Standard Key Assignment (Default). 10-6
Figure 10-3 optiPoint 500 basic - Standard Key Assignment (Default) 10-7
Figure 10-4 optiPoint 500 standard - Standard Key Assignment (Default). 10-9
Figure 10-5 optiPoint 500 advance - Standard Key Assignment (Default) 10-11
Figure 10-6 optiPoint 500 Connection Options. 10-14
Figure 10-7 optiPoint Key Module 10-16
Figure 10-8 optiPoint BLF. 10-17
Figure 10-9 optiPoint 500 Possible Configurations for Key Modules 10-19
Figure 10-10 optiPoint 500 Option Bays. 10-20
Figure 10-11 optiPoint Analog Adapter. 10-21
Figure 10-12 optiPoint ISDN Adapter 10-22
Figure 10-13 optiPoint Phone Adapter 10-23
Figure 10-14 Example of a Host-Client Configuration 10-24

Figure 10-15 optiPoint Acoustic Adapter 10-25
Figure 10-16 Y Cable for optiPoint acoustic adapter 10-26
Figure 10-17 optiPoint Recorder Adapter 10-28
Figure 10-18 optiPoint 600 office - Default Key Assignment 10-34
Figure 10-19 optiLog 4me 10-36
Figure 10-20 optiPoint 410 entry - Standard Key Assignment (Default) 10-42
Figure 10-21 optiPoint 410 economy - Standard Key Assignment (Default) 10-44
Figure 10-22 optiPoint 410 standard - Standard Key Assignment (Default) 10-46
Figure 10-23 optiPoint 410 advance - Standard Key Assignment (Default) 10-48
Figure 10-24 optiPoint 420 economy - Standard Key Assignment (Default) 10-50
Figure 10-25 optiPoint 420 economy - Standard Key Assignment (Default) 10-52
Figure 10-26 optiPoint 420 standard - Standard Key Assignment (Default) 10-54
Figure 10-27 optiPoint 420 advance - Standard Key Assignment (Default) 10-56
Figure 10-28 optiPoint 410/optiPoint 420 - Connection Options 10-58
Figure 10-29 optiPoint SLK Module 10-60
Figure 10-30 optiPoint 410 Display Module 10-61
Figure 10-31 HiPath AP 1120 10-65
Figure 10-32 Example of an External AC Adapter Connection 10-88
Figure 10-33 Example of a Corded and a Cordless Headset 10-90
Figure 10-34 optiPoint 500 standard - Standard Key Assignment (Default) for optiPoint Attendant 10-92
Figure 10-35 Gigaset S1 professional 10-98
Figure 10-36 Gigaset SL1 professional 10-99
Figure 10-37 Gigaset M1 professional. 10-100
Figure 11-1 BS3/1 S30807-H5482-X Base Station 11-4
Figure 11-2 BS3/1 (BS3/S) and BS3/3 in the Outdoor Cover S30122-X7469-X 11-5
Figure 11-3 Example of a Cordless Extension Connection in Networked Systems 11-11
Figure 11-4 Incorrect DECT Configuration of Networked HiPath 3000 Systems 11-12
Figure 11-5 Correct DECT Configuration when Networking HiPath 3000 Systems 11-13
Figure 11-6 Correct DECT Configuration when Networking HiPath 3000 Systems 11-13
Figure 12-1 Trace Monitor 12-31
Figure 12-2 The Screen Layout of the Trace Monitor 12-32
Figure 12-3 HiPath 5000 State Viewer 12-40
Figure 12-4 HiPath 5000 Services 12-42
Figure 12-5 `log.txt` File 12-43
Figure 12-6 Example of Remote Service with HiPath 3000. 12-72

Tables

Table 1-1 Information on the Intranet 1-15
Table 2-1 Boards for HiPath 3800 2-12
Table 2-2 Boards for HiPath 3750 and HiPath 3700 2-13
Table 2-3 Boards for HiPath 3550 2-14
Table 2-4 Boards for HiPath 3350 2-15
Table 2-5 Boards for HiPath 3500 2-16
Table 2-6 Boards for HiPath 3300 2-17
Table 2-7 HiPath 3000/5000 - System-Specific Capacity Limits (Maximum Configuration) 2-21
Table 2-8 Technical Specifications 2-23
Table 2-9 Telephone Interface-to-Interface Ranges (with J-Y (ST) 2x2x0.6, 0.6 mm diameter) 2-24
Table 2-10 Cable Lengths for Trunk Connection and Direct CorNet N/CorNet NQ Wiring 2-24
Table 2-11 Default Numbering for HiPath 3000/5000 V5.0 2-25
Table 2-12 Compliance with US and Canadian Standards (For U.S. and Canada Only) 2-26
Table 3-1 HiPath 3000 - Functional Overview of All Boards Used 3-1
Table 3-2 HiPath 3000 - Overview of All Boards Models Used 3-8
Table 3-3 CBCC - LED Status Meaning 3-19
Table 3-4 CBCC - X1 to X4 Contact Assignments 3-21
Table 3-5 CBCC - S_0 Interface Assignment (RJ45 Jacks) 3-21
Table 3-6 CBCC - V.24 Interface Assignment (SUB-D Plug) 3-22
Table 3-7 CBCC - LAN Connector Assignment (RJ45 Jack) via LIM 3-22
Table 3-8 Default Numbering Plan When Using CBCC in HiPath 3550 3-23
Table 3-9 Default Numbering Plan When Using CBCC in HiPath 3350 3-24
Table 3-10 CBRC - LED Status Meaning 3-26
Table 3-11 CBRC - X1 and X3 Contact Assignments 3-28
Table 3-12 CBRC - S_0 Interface Assignment (RJ45 Jacks) 3-28
Table 3-13 CBRC - V.24 Interface Assignment (SUB-D Plug) 3-29
Table 3-14 CBRC - LAN Connector Assignment (RJ45 Jack) via LIM 3-29
Table 3-15 Default Numbering Plan When Using CBRC in HiPath 3500 3-30
Table 3-16 Default Numbering Plan When Using CBRC in HiPath 3300 3-31
Table 3-17 CBCPR - V.24 Interface Assignment (SUB-D Plug) 3-34
Table 3-18 CBCPR - LAN Connector Assignment (RJ45 Jack) 3-34
Table 3-19 CBSAP - V.24 Interface Assignment (SUB-D Plug) 3-38
Table 3-20 CBSAP - LAN Connector Assignment (RJ45 Jack) 3-38
Table 3-21 Recommendations for CMA and CMS Utilization 3-41
Table 3-22 CR8N - LED Statuses 3-45
Table 3-23 LIM - RJ45 Jack Assignment. 3-51

Table 3-24 LIMS - RJ45 Jack Assignment 3-55
Table 3-25 LUNA2 - Bridging Times with Battery Pack 48 V/7 Ah and Upright Battery Housing BSG 48/38. 3-57
Table 3-26 Determining the Number of LUNA2 Modules Required Per Cabinet 3-62
Table 3-27 Multimedia Card Models and Applications 3-65
Table 3-28 UPSC-D - Bridging Times with Battery Pack S30122-K5928-X (48 V/1.2 Ah) 3-69
Table 3-29 UPSC-DR - Bridging Times with four Batteries V39113-W5123-E891 (4 x 12 V/7 Ah Batteries). 3-74
Table 3-30 UPSM - Bridging Times with Battery Pack S30122-K5950-Y200 (48 V/7 Ah) 3-81
Table 3-31 DIU2U (For U.S. Only) - LED Statuses 3-89
Table 3-32 DIUN2 - LED Statuses 3-92
Table 3-33 DIUN2 - 15-Pin Sub-D Jack Assignment 3-93
Table 3-34 DIUN2 - Assigning the System Cable S30267-Z167-Axxx. 3-93
Table 3-35 HXGM3 Board Versions 3-94
Table 3-36 HXGM3 Extension Modules 3-95
Table 3-37 HXGM3 - LED Concept 3-97
Table 3-38 HXGM3 - Assignment of V.24 Interface X10 3-97
Table 3-39 HXGM3 LAN Adapter Connector Assignment 3-98
Table 3-40 HXGM3 - LAN Adapter Cable Assignment (for U.S. only) 3-99
Table 3-41 HXGS3/HXGR3 Board Versions 3-101
Table 3-42 HXGS3/HXGR3 - Extension Modules 3-101
Table 3-43 HXGS3/HXGR3 - LAN Interface Assignment. 3-104
Table 3-44 HXGS3/HXGR3 - Assignment of V.24 Interface X10 3-105
Table 3-45 IVML8 and IVML24 - LED Statuses 3-112
Table 3-46 LAN Adapter Assignment (SIPAC 1 SU - RJ45) 3-113
Table 3-47 IVMNL/IVMN8 - LED Statuses 3-117
Table 3-48 IVMNL/IVMN8 - RJ45 Jack Assignment. 3-118
Table 3-49 IVMP8 and IVMP8R (not for U.S) - Assignment of the RJ45 Jack X3 (LAN Connector) 3-122
Table 3-50 IVMP8 and IVMP8R (not for U.S.) - LED Statuses. 3-123
Table 3-51 IVMS8 and IVMS8R - Assignment of the RJ45 Jack X3 (LAN Connector) 3-128
Table 3-52 IVMS8 and IVMS8R - LED Statuses 3-129
Table 3-53 PBXXX:- Seven Segment Display 3-131
Table 3-54 SLA8N (Not For U.S.), SLA16N, SLA24N - LED Statuses. 3-133
Table 3-55 SLA8N, SLA16N, SLA24N Assignment Cable 1 (SU Xx8) (Not for U.S.) 3-134
Table 3-56 SLA8N, SLA16N, SLA24N - Assignment Cable 2 (SU Xx9) (Not for U.S.) 3-135
Table 3-57 SLA16N, SLA24N - Assignment (SU Xx8, Xx9) (For U.S. Only) 3-136
Table 3-58 SLC16, SLC16N (Not for U.S.) - LED Statuses 3-141

Table 3-59 SLC16, SLC16N (Not for U.S.) - Cable Assignment 3-142
Table 3-60 HiPath 3750, HiPath 3700 - Maximum Number of SLA24N and SLMO24 User Groups (Depending on the Number of Base Stations Connected at SLC16 or SLC16N (Not for U.S.) 3-144
Table 3-61 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16 or SLC16N (Not for U.S.) 3-145
Table 3-62 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS2/2 Base Stations Connected to SLC16 or SLC16N (Not for U.S.) 3-146
Table 3-63 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/3 Base Stations Connected to SLC16 or SLC16N (Not for U.S.) 3-146
Table 3-64 EPSU2 - Explanation of Indicators and Ports 3-153
Table 3-65 EPSU2 - Technical Specifications. 3-153
Table 3-66 SLCN:LED Statuses 3-157
Table 3-67 SLCN - SIVAPAC Connector Assignment on the Backplane 3-158
Table 3-68 SLCN - Connector Panel Assignment with RJ45 Jacks 3-159
Table 3-69 SLCN - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16) 3-161
Table 3-70 SLMA/SLMA8 - LED Statuses. 3-164
Table 3-71 SLMA/SLMA8 - SIVAPAC Connector Assignment on the Backplane. . 3-165
Table 3-72 SLMA/SLMA8 - Connector Panel Assignment with RJ45 Jacks 3-167
Table 3-73 SLMA/SLMA8 - Connector Panel Assignment with CHAMP Jack (For U.S. Only) 3-169
Table 3-74 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16) 3-171
Table 3-75 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 17 - 24) 3-172
Table 3-76 SLMO2 and SLMO8 - LED Statuses. 3-174
Table 3-77 SLMO2/SLMO8 - SIVAPAC Connector Assignment on the Backplane 3-175
Table 3-78 SLMO2/SLMO8 - Connector Panel Assignment with RJ45 Jacks 3-177
Table 3-79 SLMO2/SLMO8 - Connector Panel Assignment with CHAMP Jack (For U.S. Only) 3-179
Table 3-80 SLMO2/SLMO8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16) 3-181
Table 3-81 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 17 - 24) 3-182
Table 3-82 SLMO8 (Not for U.S.) and SLMO24 - LED Statuses. 3-184
Table 3-83 SLMO8 (Not for U.S.), SLMO24 - Cable 1 Assignment (SU Xx8). 3-185
Table 3-84 SLMO8 (Not for U.S.), SLMO24 - Cable 2 Assignment (SU Xx9). 3-186
Table 3-85 SLMO24 - Assignment (SU Xx8, Xx9) (For U.S. Only) 3-187
Table 3-86 SLU8 Contact Assignments 3-189

Table 3-87 SLU8R Contact Assignments 3-190
Table 3-88 STLS4 Module Interface Assignments (For U.S. Only) 3-192
Table 3-89 STLS4R Contact Assignments 3-199
Table 3-90 STLSX2/STLSX4/STLSX4R - S_0 Interface Assignment 3-201
Table 3-91 STMD3 - LED Statuses 3-206
Table 3-92 STMD3 - SIVAPAC Connector Assignment on the Backplane 3-207
Table 3-93 STMD3 - Connector Panel Assignment with RJ45 Jacks. 3-208
Table 3-94 STMD3 - Connector Panel Assignment with CHAMP Jack (For U.S. Only) 3-209
Table 3-95 STMD3 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16) 3-210
Table 3-96 STMD8 - LED Statuses (H301 to H308). 3-212
Table 3-97 STMD8 - Cable and Connector Assignment (Not for U.S.) 3-218
Table 3-98 STMD8 - Assignment (SUXx8) (For U.S. Only). 3-219
Table 3-99 STMI2 - Board Variants 3-221
Table 3-100 STMI2 - Extension Modules 3-222
Table 3-101 STMI2 - V.24 Interface Assignment 3-225
Table 3-102 STMI2 - LAN Interface Assignment (RJ45 Jacks) 3-226
Table 3-103 TIEL - Functions of the DIP-FIX Switches 3-231
Table 3-104 TIEL - LED Statuses. 3-237
Table 3-105 TIEL - Cable Assignment (Not for U.S.) 3-238
Table 3-106 TIEL - Assignment (SU Xx8) (For U.S. Only) 3-240
Table 3-107 TLA2, TLA4 (Not for U.S.) - Contact Assignments. 3-242
Table 3-108 TLA8 (Not for U.S.) - Contact Assignments 3-243
Table 3-109 TLA4R (Not for U.S.) Contact Assignments 3-244
Table 3-110 TM2LP - LED Statuses. 3-247
Table 3-111 TM2LP - SIVAPAC Connector Assignment on the Backplane. 3-248
Table 3-112 TM2LP - Connector Panel Assignment with RJ45 Jacks 3-249
Table 3-113 TM2LP - Connector Panel Assignment with CHAMP Jack (For U.S. Only) 3-251
Table 3-114 TM2LP - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16) 3-252
Table 3-115 TMAMF - LED Statuses (H100) 3-255
Table 3-116 TMAMF - LED Statuses (H0 to H7) 3-255
Table 3-117 TMAMF - Cable Assignment 3-256
Table 3-118 TMC16 (for U.S. only) - LED Statuses 3-258
Table 3-119 TMC16 (for U.S. only) - SIVAPAC Connector Assignment on the Backplane. 3-259
Table 3-120 TMC16 (For U.S. Only) - Connector Panel Assignment with CHAMP Jack 3-260
Table 3-121 TMC16 (for U.S. only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16). 3-261
Table 3-122 TMCAS - Seven-Segment Display H1 3-265

Table 3-123 Assignment of the TMS2-TMCAS Connection Cable C39195-A9700-B510 3-266
Table 3-124 Assignment of the TS2-TMCAS Connection Cable C39195-A9700-B511 3-267
Table 3-125 Assignment of the TMCAS Cable C39195-A9700-B512. 3-268
Table 3-126 Assignment of the TMCAS Cable C39195-A9700-B514. 3-268
Table 3-127 TMDID (For U.S. Only) - LED Statuses. 3-272
Table 3-128 TMDID (for U.S. only) - SIVAPAC Connector Assignment on the Backplane 3-274
Table 3-129 TMDID (For U.S. Only) - Connector Panel Assignment with CHAMP Jack. 3-275
Table 3-130 TMDID (for U.S. only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16) 3-276
Table 3-131 TMDID8 (for U.S. only) - Trunk Circuits and Recommended Switch Settings 3-278
Table 3-132 TMDID8 (for U.S. only) - LED Statuses 3-278
Table 3-133 TMDID8 (for U.S. only) - Assignment (SU Xx8) 3-279
Table 3-134 TMEW2 - LED Statuses 3-282
Table 3-135 TMEW2 - SIVAPAC Connector Assignment on the Backplane 3-283
Table 3-136 TMGL4 (For U.S. Only) - Contact Assignment 3-285
Table 3-137 TMGL4R (for U.S. only) - Contact Assignment 3-287
Table 3-138 TMGL8 (for U.S. only) - LED Statuses 3-289
Table 3-139 TMGL8 (for U.S. only) - Assignment (SU Xx8) 3-289
Table 3-140 TML8W (Not for U.S.) - LED Statuses 3-291
Table 3-141 TML8W (Not for U.S.) - Cable Assignment. 3-292
Table 3-142 TMQ4 (for U.S. only) - Contact Assignment 3-294
Table 3-143 TMST1 (for U.S. only) - LED Statuses 3-296
Table 3-144 TMST1 Adapter (For U.S. Only) - Cable Assignment 3-297
Table 3-145 TMS2 (Not for U.S.) - SU Connector Assignment and Cable Color Codes 3-299
Table 3-146 TMS2 (Not for U.S.) - LED Statuses 3-300
Table 3-147 TST1 (For U.S. Only) - Contact Assignment 3-306
Table 3-148 Contact Assignments for X2 Connector 3-309
Table 3-149 Contact Assignments for the MW8 (RJ48C) jack X5. 3-309
Table 3-150 4SLA (Not for U.S.), 8SLA Contact Assignments 3-312
Table 3-151 16SLA (Not for U.S.) - Contact Assignments 3-313
Table 3-152 8SLAR Contact Assignments 3-315
Table 3-153 ALUM4 - Interface Assignments (Not for U.S.) 3-318
Table 3-154 ALUM4 - Interface Assignments (For U.S. Only) 3-319
Table 3-155 AMOM - 15-Pin Sub-D Plug Assignment 3-322
Table 3-156 ANI4 (For Selected Countries Only) - LED Statuses for Trunk 1 3-324
Table 3-157 ANI4 (For Selected Countries Only) - Contact Assignments. 3-325
Table 3-158 ANI4R (For Selected Countries Only) - Contact Assignment 3-328
Table 3-159 Announcement and Music Modules 3-329

Table 3-160 EXMNA (for U.S. only) - Contact Assignments 3-335
Table 3-161 GEE12/GEE16/GEE50 (Not for U.S.) Modules 3-337
Table 3-162 GEE12, GEE16, GEE50 (Not for U.S.) - Contact Assignments 3-338
Table 3-163 REAL - Cable and Connector Assignment 3-349
Table 3-164 REALS - SIVAPAC Connector Assignment on the Backplane. 3-353
Table 3-165 STBG4 (For France Only) - Contact Assignment. 3-355
Table 3-166 STRB Contact Assignments. 3-359
Table 3-167 STRBR Contact Assignments 3-360
Table 3-168 Pin Assignments of the V.24 Socket X2. 3-362
Table 3-169 V.24 Adapter Assignment (C39334-Z7080-C2) 3-363
Table 4-1 HiPath 3800 - Installation Procedure 4-4
Table 4-2 Electrical Connection Values (USA only) 4-6
Table 4-3 Electrical Connection Values (USA only) 4-24
Table 4-4 Maximum Number of Time-Division Multiplex Channels Required Per Board 4-47
Table 4-5 HiPath 3800 - Static Traffic Capacity 4-48
Table 4-6 HiPath 3800 - Assignment of Connectors and Jacks on the Backplane of the Basic Cabinet 4-52
Table 4-7 HiPath 3800 - Assignment of Connectors and Jacks on the Backplane of the Expansion Cabinet 4-55
Table 4-8 Color Codes for the Open-End Cable. 4-69
Table 4-9 Visual Inspection Procedure. 4-81
Table 4-10 HiPath 3750, HiPath 3700 - System Installation Procedure. 4-84
Table 4-11 Electrical Connection Values (for U.S. only). 4-88
Table 4-12 Jack Assignment on the “8-Slot” Backplane. 4-113
Table 4-13 Color Codes for the Open-End Cable. 4-121
Table 4-14 Electrical Connection Values (for U.S. only). 4-128
Table 4-15 Jack Assignment on the “8-Slot” Backplane. 4-138
Table 4-16 Number of Time-Division Multiplex Channels Required Per Board 4-156
Table 4-17 HiPath 3750 and HiPath 3700 - Static Traffic Capacity 4-159
Table 4-18 Visual Inspection Procedure. 4-162
Table 4-19 HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 - System Installation Procedure. 4-164
Table 4-20 Electrical Connection Values (for U.S. only). 4-167
Table 4-21 HiPath 3550 and HiPath 3350 - Static Traffic Capacity 4-184
Table 4-22 Electrical Connection Values (for U.S. only). 4-187
Table 4-23 HiPath 3500 and HiPath 3300 - Static Traffic Capacity 4-197
Table 5-1 HiPath 3800 - Startup Procedure 5-2
Table 5-2 RUN LED - LED Status Meaning 5-3
Table 5-3 Entering the Country Code and Selecting the Password Type 5-7
Table 5-4 Entering the System Number 5-9
Table 5-5 HiPath 3750 and HiPath 3700 - Startup Procedure 5-11
Table 5-6 RUN LED - LED Status Meaning 5-12
Table 5-7 Entering the Country Code and Selecting the Password Type 5-15

Table 5-8 Entering the System Number 5-17
Table 5-9 Startup Procedure 5-19
Table 5-10 RUN LED - LED Status Meaning 5-20
Table 5-11 Entering the Country Code and Selecting the Password Type 5-23
Table 5-12 Entering the System Number 5-25
Table 6-1 Feature Server Components 6-7
Table 6-2 HW and SW Minimum Requirements for HiPath 5000 6-9
Table 6-3 RAM Space of the HiPath 5000 Server 6-10
Table 6-4 Prerequisites for a Single-PC Solution 6-10
Table 6-5 HiPath 5000 - Preparing for Installation 6-12
Table 6-6 Software Components and Master Setup Tools 6-14
Table 6-7 Operating System Settings for HiPath 5000 6-45
Table 6-8 GetAccount - Data Record Structure 6-56
Table 6-9 P 500 UPS - Meaning of Displays, Switches and Jacks 6-60
Table 7-1 HiPath 3800 as a Gateway - Procedure for System Installation and Startup 7-2
Table 7-2 HiPath 3700 as a Gateway - Procedure for System Installation and Startup 7-4
Table 7-3 HiPath 3500 as a Gateway - Procedure for System Installation and Startup 7-6
Table 7-4 HiPath 3300 as a Gateway - Procedure for System Installation and Startup 7-8
Table 8-1 Features subject to mandatory licensing 8-4
Table 9-1 Startup Rules for Inserting and Removing Boards 9-2
Table 9-2 Startup Rules for Inserting and Removing Boards 9-4
Table 9-3 EPSU2-R - Explanation of Display and Connecting Elements 9-11
Table 10-1 Floating contacts on the optiPoint acoustic adapter 10-26
Table 10-2 Comparison of optiset E and optiPoint 500 adapters 10-30
Table 10-3 System-Specific Maximum Configuration for $U_{P0/E}$ Workpoint Clients, Add-On Devices, and Adapters 10-31
Table 10-4 Comparison of optiPoint 600 office and optiset E memory 10-34
Table 10-5 optiPoint 410/optiPoint 420 - Description of Connections 10-59
Table 10-6 Add-On Device Configuration at an optiPoint 410 and optiPoint 420 Telephone 10-63
Table 10-7 Technical Data (Resources) of the HG 1500 Boards Defined as Media Gateways 10-66
Table 10-8 HG 1500 - Board-Specific Capacity Limits (Maximum Configuration) 10-67
Table 10-9 Number of Required Gateway Channels (HG 1500 Boards) 10-68
Table 10-10 HG 1500 - Board-Specific Sum of PPP Channels and Gateway Channels (Maximum Numbers) 10-71
Table 10-11 Required Performance Level for Voice over IP 10-72
Table 10-12 Performance Requirements for Routing and vCAPI 10-74
Table 10-13 Pin Assignments of the Local Power Supply AUL:06D1284 (Euro) . . . 10-88

Table 10-14 Connection Options for Corded and Cordless Headsets 10-91
Table 11-1 HiPath Cordless Office - System Configuration for HiPath 3000 V5.0 . . . 11-3
Table 11-2 Technical Data for Various Base Stations 11-4
Table 11-3 HiPath 3750, HiPath 3700 - Maximum Number of SLA16N and SLMO24 Subscriber Line Modules Depending on the Number of Base Stations Connected to SLC16 or SLC16N 11-6
Table 11-4 HiPath 3550, HiPath 3500 - Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to CBCC or CBRC 11-7
Table 11-5 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16 or SLC16N 11-7
Table 11-6 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS2/2 Base Stations Connected to SLC16 or SLC16N 11-8
Table 11-7 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS3/3 Base Stations Connected to SLC16 or SLC16N 11-9
Table 11-8 Required B channels for Multi-SLC and System-Wide Networking 11-10
Table 12-1 Startup Rules for Inserting and Removing Boards 12-8
Table 12-2 RUN LED - LED Status Meaning 12-23
Table 12-3 Power Supply Status Displays 12-24
Table 12-4 HiPath 3000 Manager E - Example of Status Display of Peripheral Boards 12-25
Table 12-5 Trace Monitor Menu Functions. 12-33
Table 12-6 Terminal Test 12-37
Table 12-7 HiPath 3000 Class B Error Messages 12-49
Table 12-8 Event Viewer Entries for the HiPath 5000 Server. 12-57
Table 12-9 Variable password concept: Pre-Determined User Groups and Their Access Rights 12-82
Table 12-10 Fixed Password: Fixed User Groups and Their Access Rights 12-83
Table 13-1 Standards Supported 13-3
Table 13-2 Possible QoS Settings 13-5
Table A-1 Starting System Administration (Service). A-1
Table A-2 Expert Mode Code Groups. A-2
Table A-3 Expert Mode Codes A-3
Table B-1 Codes for Activating/Deactivating Features B-1
Table B-2 Description of the Different Workpoint Client Groups. B-22
Table C-1 HiPath 3000 - IP Protocols and Port Numbers Used C-2
Table C-2 HiPath 5000 - IP Protocols and Port Numbers Used C-3
Table C-3 HiPath ComScendo Service - IP Protocols and Port Numbers Used. C-5
Table C-4 HiPath FM Managed Systems - IP Protocols and Port Numbers Used C-7
Table C-5 HG 1500 - IP Protocols and Port Numbers Used C-8

Table C-6 optiClient 130 V5.0 - IP Protocols and Port Numbers Used C-11
Table C-7 optiPoint 400, optiPoint 410, optiPoint 420, optiPoint 600 office - Used IP Protocols and Port Numbers C-12
Table C-8 HiPath AP 1120 - IP Protocols and Port Numbers Used. C-14
Table C-9 Middleware for Call Control - IP Protocols and Port Numbers Used. . . . C-15
Table D-1 Nominal Output of the HiPath 3800 Power Supply Unit D-2
Table D-2 HiPath 3800 Board Power Requirement D-2
Table D-3 Nominal Output of the HiPath 3750 Power Supply Unit and HiPath 3700. . . . . D-4
Table D-4 HiPath 3750 and HiPath 3700 Board Power Requirement D-4
Table D-5 Nominal Output of the HiPath 3550 Power Supply Units D-6
Table D-6 HiPath 3550 Board Power Requirement D-6
Table D-7 Nominal Output of the HiPath 3350 Power Supply Units D-8
Table D-8 HiPath 3350 Board Power Requirement D-8
Table D-9 Nominal Output of the HiPath 3500 Power Supply Units D-10
Table D-10 HiPath 3500 Board Power Requirement D-10
Table D-11 Nominal Output of the HiPath 3300 Power Supply Units D-11
Table D-12 HiPath 3300 Board Power Requirement D-11
Table D-13 Workpoint Clients, Key Modules and Adapter Power Requirements . . . D-12

Abbreviations

This list contains the abbreviations used in this manual.

A

ADPCM	Adaptive Difference Pulse Code Modulation
ALUM	Trunk failure transfer
AMHOST	Administration and Maintenance via HOST
ANI	Automatic Number Identification
ANI4R	Automatic Number Identification Rack
APS	System Program System

B

BC	Basic Cabinet (HiPath 3750/HiPath 3700)
BHCA	Busy Hour Call Attempts
BSG	Add-on device
BSG	Upright battery housing

C

CABLU	Cabling Unit
CAS	Channel Associated Signaling
CBCC	Central Board with Coldfire Com
CBCP	Central Board with Coldfire Point
CBCPR	Central Board with Coldfire Pro
CBRC	Central Board Rack Com
CBSAP	Central Board Synergy Access Platform
CCBS	Completion of Calls to Busy Subscribers
CDB	Customer Database
CDB	Customer Database
CLA	Customer License Agent
CLC	Customer License Client
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction

CLM	Customer License Manager
CLS	Central License Server
CMA	ADPCM clock module
CMS	Clock Module Small
CPFSK	Continuous Phase Frequency Shift Keying
CR	Code Receiver
CUC	Connection Unit Com
CUCR	Connection Unit Com Rack
CUP	Connection Unit Point
CUPR	Connection Unit Point Rack
D	
DECT	Digital Enhanced Cordless Telecommunications
DiffServ	Differentiated Services
DIU2U	Digital Interface Unit 2 Universal
DIUN2	Digital Interface Unit ISDN
DMC	Direct Media Connection
DSP	Digital Signal Processor
E	
EBP	Slot (board)
EBR	Extension Cabinet 19" Rack
EC1	First Expansion Cabinet (HiPath 3750/HiPath 3700)
EC2	Second Expansion Cabinet (HiPath 3750/HiPath 3700)
ECG	Euro-ISDN–CAS-Gateway
ECGM	Euro-ISDN-CAS-Gateway Maintenance
ECT	Explicit Call Transfer
EPSU	External Power Supply Unit
Erl	Erlangs
ESD	Electrostatically Sensitive Devices
eSHB	Electronic Service Manual
ET	Door opener
EVM	Entry Voice Mail

F	
FSK	Frequency Shift Keying
G	
GAP	Generic Access Profile
GEE	Call Metering Receiving Equipment
GPCF	Grace Period Configuration File
H	
HA	Handset
HOPE	Hicom Office PhoneMail Entry
HPCO	HiPath ProCenter Office
HXGM	HiPath Xpress Gateway Medium
HXGR	HiPath Xpress Gateway Rack
HXGS	HiPath Xpress Gateway Small
I	
IMODN	Integrated Modem Card New
IP	Internet Protocol
IVML	Integrated Voice Mail Large
IVMNL	Integrated Voice Mail New Large
IVMP	Integrated Voice Mail Point
IVMPR	Integrated Voice Mail Point Rack
IVMS	Integrated Voice Mail Small
IVMSR	Integrated Voice Mail Small Rack
L	
LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diode
LIM	LAN Interface Module
LIMS	LAN Interface Module for SAPP
LM	Feature
LS	Loop start
M	
MCID	Malicious Call Identification
MDFU	Main Distribution Frame Universal

MDFU-E	Main Distribution Frame Universal, Enhanced
MMC	Multimedia Card
MSN	Multiple Subscriber Number
MW	Mini-Western
N	
NT	Network Termination
O	
OPAL	Option Adapter Long
OPALR	Option Adapter Long Rack
P	
PCM	Personal Call Manager
PCM	Pulse Code Modulation
PDM1	PMC DSP modules
PDS	Permanent Data Service
PFT	Power Failure Transfer
PSE	Paging system
PSUP	Power Supply Unit Point
Q	
QoS	Quality of Service
R	
RDT	Remote Data Transfer
REAL	Relay and Trunk Failure Transfer
REALS	Relay and ALUM (power failure transfer) for SAPP
RJ	Registered Jack
RLF	Real License File
RSM	Real-Time Services Manager
S	
SELV	Safety Extra-Low Voltage Circuit
SLA	Subscriber Line Analog
SLAR	Subscriber Line Analog Rack
SLC	Subscriber Line Cordless
SLCN	Subscriber Line Cordless New

SLK	Self-Labeling Key
SLMA	Subscriber Line Module Analog
SLMO	Subscriber Line Module Cost Optimized UP0/E
SLU	Subscriber Line UP0/E
SLUR	Subscriber Line UP0/E Rack
SMR	Service Maintenance Release
SNG	Local power supply
SP	Service Provider
SP	Surge protector
STLS	Subscriber Trunk Line S0
STLSR	Subscriber And Trunk Line S0 Rack
STLSX	Subscriber Trunk Line S0 with ISAC-SX
STLSXR	Subscriber Trunk Line S0 with ISAC-SX Rack
STMD	Subscriber And Trunk Module Digital S0
STRB	Control Relay Module
STRBR	Control Relay Module Rack
T	
TAPI	Telephony Application Programming Interface
TIEL	Tie Line Ear & Mouth
TLA	Trunk Line Analog
TLAR	Trunk Line Analog Rack
TM2LP	Trunk Module Loop Procedure
TMAMF	Trunk Module Analog for Multifrequency Code Signalling
TMC	Trunk Modules Central office
TMCAS	Trunk Module Channel Associated Signaling
TMDID	Direct Inward Dialing
TMEW	Trunk Modules for E&M World
TMGL4	Trunk Module Ground Start/Loop Start
TMGL4R	Trunk Module Ground Start/Loop Start Rack
TML8W	Trunk Module Loop Start World
TMOM	Trunk Module Outgoing Multipurpose
TMS2	Trunk Module S2M

TMST1	Trunk Modules S1/T1
TS2	Trunk Module S2M
TS2R	Trunk Module S2M Rack
TW	Twin Wire

U

UAE	Universal socket
UPSC-D	Uninterruptible Power Supply Com-DECT
UPSC-DR	Uninterruptible Power Supply Com-DECT Rack
UPSM	Uninterruptible Power Supply Modular
UPSMres	Uninterruptible Power Supply Modular Reset Signal

V

VPN	Virtual Private Network

W

WAP	Wireless Application Protocol
WpC	Workpoint Client

Index

Numerics
16SLA 3-312
    connection conditions 3-314
    contact assignments 3-313
    interfaces 3-313
4SLA/8SLA 3-312
    connection conditions 3-314
    contact assignments 3-312
    interfaces 3-312
802.1p field 13-4
8SLAR
    contact assignments 3-315
    interfaces 3-315
    module specifications 3-316
8-slot cabinets (HiPath 3700) 4-137
8-slot cabinets (HiPath 3750) 4-112

A
AC outlet (for U.S. only)
    HiPath 3500/HiPath 3300 4-187
    HiPath 3550/HiPath 3350 4-167
    HiPath 3700 4-128
    HiPath 3750 4-88
    HiPath 3800 4-6
Access Security 12-79
Accidents, reporting 1-12
ALUM4 3-317
    basic structure 3-320
    contact assignments 3-318
    interfaces 3-318
AMHOST 12-84
AMOM 3-321
    Assignment 3-322
    Variants 3-321
Analog boards for tie trunk traffic
    TIEL 3-227
    TMEW2 3-280
Analog modem 12-73
ANI4 (for selected countries only) 3-323
    contact assignments 3-325
    installation instructions 3-326
    interfaces 3-323
    LED statuses 3-323
ANI4R (for selected countries only) 3-327
    contact assignment 3-328
    figure 3-327
    interfaces 3-327
Announcement and music modules 3-329
APS stamp 12-15
APS Transfer 12-12
APS transfer 12-11
Archive file (.arc) 12-89
Assigning Station Numbers 5-4, 5-13, 5-21
Attendant Console Versions 10-92

B
B channel modem 12-73
Backing up system components 12-19
Backplane HiPath 3700
    basic cabinet 4-137
    expansion cabinet 4-138
    jacks 4-138
Backplane HiPath 3750
    basic cabinet 4-112
    expansion cabinet 4-113
    jacks 4-113
Backplane HiPath 3800
    basic cabinet 4-50
    connector panels with CHAMP jack (for U.S. only) 4-61
    connector panels with RJ45 jacks 4-59
    connector panels with SIPAC 1 SU connectors 4-62
    expansion cabinet 4-53
    SIVAPAC connector 4-56
Backup Manager 12-6, 12-19
Bandwidth 13-2
Base station power supply 3-162
Base stations 11-2
Battery cabinet BSG 48/38 3-63, 3-84
Battery disposal 1-11

Baud rates for HiPath 3000 Manager E 12-73
Board overview
    HiPath 3300 3-17
    HiPath 3350 3-14
    HiPath 3500 3-16
    HiPath 3550 3-12
    HiPath 3700 3-10
    HiPath 3750 3-10
    HiPath 3800 3-8
Board power requirement D-1
Boards HiPath 3750/HiPath 3700
    initializing 4-154
    inserting/removing 4-160
    overview 3-10
    peripheral board, width 4-154
    slots 4-152
    upgrading, replacing 9-4
Boards HiPath 3800
    initializing 4-44
    inserting/removing 4-34
    overview 3-8
    slots 4-31
    upgrading, replacing 9-2
Bridging times
    LUNA2 3-57
    UPSC-D 3-69
    UPSC-DR 3-74
    UPSM 3-81
BSG 48/38 3-63, 3-84

C

CABLU (HiPath 3550/HiPath 3350) 4-176
CABLUs (HiPath 3750) for MDFU/MDFU-E 4-117
CABLUs (HiPath 3800) for MDFU or -E 4-56
Call number tables 6-8
Capacity limits for UP0/E workpoint clients, add-on devices, and adapters 10-31
Capacity limits HiPath 3000/HiPath 5000 2-21
CAR tables 6-8
CAS protocol 3-130, 3-262, 3-298, 3-307
CBCC 3-18
    figure 3-20
    LAN connector assignment via LIM 3-22
    LED status meaning 3-19
    numbering plan for HiPath 3350 3-24
    numbering plan for HiPath 3550 3-23
    S0 interface assignment 3-21
    V.24 interface assignment 3-22
    X1 to X4 contact assignments 3-21
CBCP (for DTAG only) 3-18
CBCPR 3-32
    figure 3-33
    LAN connector assignment 3-34
    switches and indicators 3-32
    V.24 interface assignment 3-34
CBRC 3-25
    figure 3-27
    LAN connector assignment via LIM 3-29
    LED status meaning 3-26
    numbering plan for HiPath 3300 3-31
    numbering plan for HiPath 3500 3-30
    S0 interface assignment 3-28
    V.24 interface assignment 3-29
    X1 and X3 contact assignments 3-28
CBSAP 3-35
    diagram 3-36
    front panel 3-37
    LAN connector assignment 3-38
    V.24 interface assignment 3-38
CDB backup 12-3
CDB conversion 9-31
Central board
    HiPath 3300 3-25
    HiPath 3350 3-18
    HiPath 3500 3-25
    HiPath 3550 3-18
    HiPath 3700 3-32
    HiPath 3750 3-32
    HiPath 3800 3-35
Central boards 3-1
Central License Server (CLS) 8-2
Changing the system time 8-36
Checking services 12-42
CMA 3-39

CMS 3-40
Codecs 13-3
Codes
    controlling feature B-1
    system programming (expert mode codes) A-1
Color code 4-121
Common Web Service 6-37
Compliance 2-26
    CE 2-26
    US and Canadian standards 2-26
Conformity
    FCC 2-27
Connecting a Printer 9-6
Connection cable for expansion cabinet ECR 4-194
Correcting errors 12-70
Country code, entering 5-7, 5-15, 5-23
Country initialization 5-7, 5-15, 5-23
Cover 4-35
CR8N 3-44
    figure 3-45
    LED statuses 3-45
CSTA/V24 cable, assignment 3-364
CUC 3-46
CUCR 3-46
CUP 3-47
CUPR 3-47
Customer data
    effects due to hardware changes 12-8
Customer data backup 12-3
Customer database (CDB) conversion 9-31
Customer License Agent (CLA) 8-2, 12-45
Customer License Manager (CLM) 8-2, 12-45

D

DBSAP 3-48
    figure 3-48
Delay 13-2
Deployment tool 10-57
Determining system information 12-18
Diagnosis options 12-23
DiffServ code point 13-4
Digital modem 12-73
Direct media connection DMC 10-70
Disposal, batteries 1-11
DIU2U (for U.S. only) 3-86
    front panel 3-88
    LED statuses 3-89
    LEDs 3-88
DIUN2 3-90
    assigning the system cable 3-93
    front panel 3-91
    LED statuses 3-92
    switches, display 3-91
DoorCom Analog 9-25
Double key assignment 10-4

E

E&M
    interface types 3-228
    signaling protocols 3-229
ECG cabinet 3-262, 3-298, 3-307
ECG protocol converter 3-262, 3-298, 3-307
ECGM tool 3-262, 3-270
ECR, installing 9-8
Electrical environment 2-2
Emergencies 1-12
Entrance telephones 9-24
Environmental conditions 2-32
EPSU2 3-151
EPSU2-R 9-18
Error messages
    HiPath 3000 12-48
    HiPath 5000 12-57
Error signaling interval 12-76
Euro-ISDN–CAS gateway ECG 3-262, 3-298, 3-307
Event Viewer for HiPath 5000 12-38
    error messages 12-57
Eventlog for HiPath 3000 12-37
    error messages 12-48
Eventlog for HiPath 5000 12-38
    error messages 12-57
EVM 3-332
    interfaces 3-333
Exchanging boards 12-10
Exchanging telephones 12-10
Exchanging workpoint clients 12-10

EXM
  slot for HiPath 3550/HiPath 3350 3-330
EXMNA (for U.S. only) 3-334
  contact assignments 3-335
  figure 3-334
  slot in HiPath 3550 and HiPath 3350 3-334
EXMR
  connection to HiPath 3500 and HiPath 3300 3-331
Expansion cabinet rack ECR, connection cable 4-194
Expansion cabinet rack ECR, installing 9-8
Expert mode codes
  account code A-4
  analog CO interface A-16
  announcement/music A-20
  attendant A-27
  call detail recording A-3
  Call distribution A-25
  CO call privileges A-6
  codes A-19
  configure station A-4
  DISA A-27
  displays A-11
  door relays A-19
  edit CDB data A-21
  incoming calls A-7
  ISDN parameters A-11
  Least Cost Routing (LCR) A-27
  networking A-9
  radio paging equipment A-26
  relays A-20
  remote service A-25
  sensors A-20
  speed dialing system A-3
  system details A-21
  system settings A-16
  traffic restriction A-10
Extension connection 11-10
External power supply EPSU2 3-151
External power supply EPSU2-R 9-18

F
Fan connection (in ECR) 9-21
Fan kit for HXGS3 in HiPath 3550/HiPath 3350 3-106
Feature Server 6-5
  trace files 12-30
Ferrite for HiPath 3550/HiPath 3350 4-179
Firewall C-1
Flexible port numbering C-12
FM Reporting client 6-23, 6-37

G
Gatekeeper 10-38
Gateway 10-38
  HiPath 3300 7-8
  HiPath 3500 7-6
  HiPath 3700 7-4
  HiPath 3800 7-2
Gateway Channels (HG 1500) 10-68
Gateway functionality (HG 1500) 10-68
GEE12/GEE16/GEE50 (not for U.S.) 3-337
  Contact assignments 3-338
  interfaces 3-337
  modules 3-337
GEE8 (not for U.S.) 3-336
  Figure 3-336
  Level setting 3-336
GetAccount 6-54
Gigaset active EX 10-102
Gigaset active M 10-101
Gigaset M1 professional 10-100
Gigaset S1 professional 10-98
Gigaset SL1 professional 10-99
Grace period 8-6
Ground loops (HiPath 3700) 4-136
Ground loops (HiPath 3750) 4-106
Ground loops (HiPath 3800) 4-15, 4-30
Grounding
  ext. MDF (HiPath 3550) 4-173
  HiPath 3500/HiPath 3300 4-192
  HiPath 3700 4-134, 4-136
  HiPath 3750 4-106, 4-111
  HiPath 3800 (19-inch cabinet installation) 4-28, 4-30
  HiPath 3800 (standalone installation) 4-15, 4-20

H
H.323 protocol 13-2
HDLC highways for HiPath 3800 4-45
HDLC segments for HiPath 3750/HiPath 3700 4-156
HG 1500
  boards 3-94, 3-100, 3-221
  determining the required number of boards 10-66
  division of resources 10-39
  hardware requirements 9-30
  payload resources 10-39
  resetting the signaling gateway 12-70
  Resource Manager 10-39
  signaling resources 10-39
  technical Data (resources) of boards 10-66
HG 1500 capacity limits 10-67
Hicom Office PhoneMail Entry board (for U.S. only) 3-339
hicom.pds 12-4
HiPath 3000 2-2
HiPath 3000, upgrading (HW/SW) 9-29
HiPath 3300
  as a gateway 7-8
  design and dimensions 2-11
  installation 4-163
  numbering plan 3-31
  startup 5-19
  system environment 2-17
HiPath 3350
  design and dimensions 2-8
  installation 4-163
  numbering plan 3-24
  startup 5-19
  system environment 2-15
HiPath 3500
  as a gateway 7-6
  design and dimensions 2-10
  installation 4-163
  numbering plan 3-30
  startup 5-19
  system environment 2-16
HiPath 3550
  design and dimensions 2-7
  installation 4-163
  numbering plan 3-23
  startup 5-19
  system environment 2-14
HiPath 3700
  as a gateway 7-4
  design and dimensions 2-9
  installation 4-83
  startup 5-11
  system environment 2-13
HiPath 3750
  design and dimensions 2-5
  installation 4-83
  startup 5-11
  system environment 2-13
HiPath 3800
  as a gateway 7-2
  design and dimensions 2-3
  installation 4-3
  startup 5-2
  system environment 2-12
HiPath 3800 installation
  installing boards 4-31
  mounting connector panels 4-39
HiPath 5000 2-18, 6-1
  basic configuration 6-47
  configuring the administration unit 6-49
  Feature Server 6-5
  HiPath Manager PCM Trace Monitor 12-30
  operating system settings 6-45
  Presence Manager 6-7
  RAM requirements 6-9
  requirements 6-9
  software structure 6-5
  startup, installation 6-12
  Status viewer 12-40
HiPath AP 1120 10-65, C-14
HiPath ComScendo Service 2-18, 6-2, 10-38, C-5
  configuration 6-48
  State viewer 12-40

HiPath Cordless Office 11-1
  Base stations 11-2
  capacity limits 11-6
  configuring 10-104
  EPSU2 external power supply 3-151
  extension connection 11-10
  login window 10-104
  mobile telephones 10-98
  multi-SLC 11-10
  outdoor cover 11-5
  single-cell BS 11-2, 11-3
  SLC16/SLC16N (not for U.S.) 3-139
  supplying power to base stations 3-147
  system configuration 11-3
  system numbers 10-104
  system-wide networking 11-10
  tech. base station data 11-4
HiPath Entry Voice Mail EVM 3-332
HiPath Fault Management 12-44
  installing 6-30
HiPath Inventory Manager 12-18
  analysis 12-46
  installing 6-35
HiPath License Management 6-44, 8-2
HiPath Manager PCM 6-53
HiPath Manager PCM Trace Monitor 12-30
HiPath Software Manager
  analysis 12-46
  APS transfer 12-16
  backing up customer data 12-6
  backing up system components 12-19
  determining system information 12-18
HiPath User Management 12-21
HiPath Xpressions Compact
  boards 3-109, 3-114, 3-119, 3-124
HOPE (for U.S. only) 3-339
  components 3-339
  figure 3-339
HXGM3 3-94
  determining the required number 10-66
  extension modules 3-95
  figure 3-95
  interfaces 3-96
  LAN adapter cable for backplane (U.S. only) 3-99
  LAN adapter connector for backplane 3-98
  LED statuses 3-97
  Techn. Data (resources) 10-66
  V.24 interface 3-97
  versions 3-94
HXGR3 3-100
  determining the required number 10-66
  extension modules 3-101
  figure 3-102
  interfaces 3-103
  LAN interfaces 3-104
  V.24 interface 3-105
  versions 3-101
HXGS3 3-100
  determining the required number 10-66
  extension modules 3-101
  fan kit for HiPath 3550/HiPath 3350 3-106
  figure 3-102
  interfaces 3-103
  LAN interfaces 3-104
  V.24 interface 3-105
  versions 3-101

I

IMODN 3-50, 12-73
Information on the intranet 1-15

Installation HiPath 3500/HiPath 3300 4-163
  grounding the system 4-192
  installation in a 19-inch cabinet 4-190
  installation site 4-187
  installation versions 4-186
  procedure 4-164
  slots HiPath 3300 4-196
  slots HiPath 3500 4-195
  tools and resources 4-163
  unpacking the components 4-188
  visual inspection 4-198
  wall installation 4-189
Installation HiPath 3550/HiPath 3350 4-163
  attaching ferrite 4-179
  attaching the system to the wall 4-172
  connecting the cable 4-176
  installation site 4-165
  MDFU 4-173
  procedure 4-164
  slots HiPath 3350 4-183
  slots HiPath 3550 4-182
  system overview HiPath 3350 4-183
  system overview HiPath 3550 4-181
  tools and resources 4-163
  unpacking the components 4-168
  visual inspection 4-185
Installation HiPath 3700 4-83
  checking the grounding 4-136
  connecting the cable 4-137
  connection cable BC-EC 4-139
  grounding 4-134
  installation site 4-128
  installing subboards 4-151
  loading the system software 4-151
  mounting the patch panel 4-133
  mounting the system cabinet 4-129
  procedure 4-84
  removing cabinet covers 4-129
  resources, tools 4-83
  stripping the open-end cable 4-148
  unpacking the components 4-128
  visual inspection 4-162
Installation HiPath 3750 4-83
  checking the grounding 4-111
  connecting the cable 4-112
  connection cable BC-EC 4-114
  grounding 4-106
  installation site 4-87
  installing subboards 4-151
  installing the Main Distribution Frame 4-90
  line network, jumpers 4-122
  loading the system software 4-151
  mounting the seismic anchors 4-104
  procedure 4-84
  removing cabinet covers 4-92
  resources, tools 4-83
  setting up system cabinets 4-91
  single cabinet 4-93
  stabilizer feet 4-97
  stripping the open-end cable for MDFU/MDFU-E 4-120
  three cabinets stacked 4-102
  two cabinets side by side 4-98, 4-101
  two cabinets stacked 4-95
  unpacking the components 4-89
  visual inspection 4-162

Installation HiPath 3800 4-3
    19-inch cabinet installation 4-21
        checking the grounding 4-30
        grounding 4-28
        installation site 4-21
        installing the system cabinet 4-25
        unpacking the components 4-24
    connection cable to backplane 4-49
    inserting patch panel 4-70
    inserting S0 patch panel 4-74
    installing subboards 4-79
    loading system software 4-79
    procedure 4-4
    resources, tools 4-3
    standalone installation 4-5
        attaching covers 4-82
        checking grounding 4-20
        grounding 4-15
        installation site 4-5
        setting up system cabinets 4-8
        single cabinet 4-9
        two cabinets (stacked) 4-10
        two-cabinet system (side by side) 4-13
        unpacking the components 4-7
    striping an open-end cable for patch panel 4-77
    stripping an open-end cable for the MDFU-E 4-68
    visual inspection 4-81
Installing HiPath ComScendo Service 6-21
Installing subboards 4-79
Integrated modem IMODN 3-50, 12-73
IP network requirements 13-2
IP protocols C-1
ISDN Message Decoder 12-29
ISDN Routing (HG 1500) 10-71
IVML8/IVML24 3-109
    figure 3-111
    LAN adapter 3-113
    LED statuses 3-112
    lockout switch 3-111
    packing protection covering 3-110
IVMNL/IVMN8 3-114
    front panel 3-116
    LED statuses 3-117
    LEDs 3-116
    lockout switch 3-117
    packing protection covering 3-115
IVMP8/IVMP8R (not for U.S.) 3-119
    figure 3-121
    LAN connector assignment 3-122
    LED statuses 3-123
    lockout switch, reset board 3-121
    packing protection covering 3-120
IVMS8/IVMS8R 3-124
    figure 3-126
    LAN connector assignment 3-128
    LED statuses 3-129
    lockout switch 3-126
    packing protection covering 3-125

J

Jumper strips
    assignment 4-123

K

Key assignment, double 10-4

L

LAN adapter cable for backplane HiPath 3750/HiPath 3700 (U.S. only) 3-99
LAN adapter connector for backplane HiPath 3750/HiPath 3700 3-98
License Failure Period 8-6

Licensing 6-44, 8-1
  analysis 12-45
  error 8-6
  Feature Server 8-11
  features subject to mandatory licensing 8-4
  grace period 8-6
  HiPath License Management 6-44, 8-2
  License Failure Period 8-6
  link to MAC address 8-12
  optiClient Attendant 8-26
  procedure with HiPath 3000 Manager E 8-7
  protection against manipulation 8-36
  replacing hardware 8-23
  scenarios 8-12
  upgrading 8-17
LIM 3-51
LIMS 3-54
Local power supply, AC adapters 10-87
LOG area 12-86, 12-89
log.txt file 12-43
LUNA2 3-56
  bridging times 3-57
  Calculating number required 3-62
  figure 3-58
  indicators and switches 3-58

M
MAC address 8-12
Main distribution frame 4-65, 4-90, 4-168, 4-173
Main distribution frame (HiPath 3550/ HiPath 3350)
  installation 4-168
MDFU 4-90, 4-124, 4-168, 4-173
MDFU-E 4-65, 4-90, 4-125
MMC 3-65
  replacing 12-11
Mobile telephones 10-98
  check login status 10-106
  logging on to the system 10-104
Multimedia card 3-65
Multi-SLC 11-10

N
Network Analysis 13-6
Network termination NT
  cable set for Spain/Portugal (HiPath 3550/HiPath 3500) 3-311
  Power supply (S2M, HiPath 3550/HiPath 3500) 3-310
  Power supply (S2M, HiPath 3750/HiPath 3700) 3-301
  S0 connection 3-213
  S2M conenction (HiPath 3750/HiPath 3700) 3-301
  S2M connection (HiPath 3550/HiPath 3500) 3-310
Numbering plan 2-25

O
Offline programming 5-10, 5-18, 5-26
OPAL 3-341
OPALR 3-341
Open numbering 6-8
Operating conditions 2-32
optiClient 130 V5.0 10-64
optiClient Attendant 10-93
  licensing 8-26
optiLog 4me 10-36
Options 3-6
optiPoint 410 10-40
  accessories 10-87
  add-on device configurations 10-63
  connection options 10-58
  optiPoint 410 advance 10-47
  optiPoint 410 display module 10-61
  optiPoint 410 economy 10-43
  optiPoint 410 entry 10-41
  optiPoint 410 standard 10-45
  optiPoint SLK module 10-60
  telephones
    connection and startup 10-57
  using optiPoint 500 adapters 10-63

optiPoint 420 10-40
  - accessories 10-87
  - add-on device configurations 10-63
  - connection and startup 10-57
  - connection options 10-58
  - optiPoint 410 display module 10-61
  - optiPoint 420 advance 10-55
  - optiPoint 420 economy 10-49
  - optiPoint 420 economy plus 10-51
  - optiPoint 420 standard 10-53
  - optiPoint SLK module 10-60
  - using optiPoint 500 adapters 10-63

optiPoint 500 10-3
  - accessories 10-87
  - adapter configurations 10-29
  - connecting 10-13
  - connection options 10-14
  - connection requirements 10-12
  - option bays 10-20
  - optiPoint 500 advance 10-10
  - optiPoint 500 basic 10-7
  - optiPoint 500 economy 10-6
  - optiPoint 500 entry 10-5
  - optiPoint 500 standard 10-8
  - optiPoint 500 standard SL (for U.S. only) 10-8
  - optiPoint acoustic adapter 10-25
  - optiPoint analog adapter 10-21
  - optiPoint BLF 10-17
  - optiPoint ISDN adapter 10-22
  - optiPoint key module 10-16
  - optiPoint phone adapter 10-23
  - optiPoint recorder adapter 10-28
  - USB 1.1 interface 10-15

optiPoint 600 office 10-33
  - accessories 10-87

optiPoint Attendant 10-92

optiset E privacy module 10-37

Outdoor cover 11-5

P
Part numbers
  backplanes (HiPath 3700) 4-140, 4-141
  backplanes (HiPath 3750) 4-115, 4-116
  cabinets (HiPath 3700) 4-140, 4-141
  cabinets (HiPath 3750) 4-115, 4-116
  CABLUs, open-end cables (HiPath 3700) 4-142
  CABLUs, open-end cables (HiPath 3750) 4-117
  CABLUs, open-end cables (HiPath 3800) 4-56, 4-63
  connection cable (HiPath 3750) 4-115
  connection cables (HiPath 3700) 4-140, 4-141
  connection cables (HiPath 3750) 4-116
Password 12-79
Password type, defining 5-7, 5-15, 5-23
PBXXX 3-130
  Front panel 3-130
  Seven Segment Display 3-131
PCM segments for HiPath 3750/HiPath 3700 4-156
PCM segments for HiPath 3800 4-45
PDM1 3-95, 3-101
PDMX 3-222
PDS file 12-4
Peripheral boards 3-3
PFT1/PFT4 (not for U.S.) 3-343
  assignment 3-345
  installation location 3-344
Pin assignments of the V.24 sockets 3-362
Port numbers C-1
Power failure transfer 3-346
Power plug (for U.S. only) HiPath 3800 4-24
Power requirement (boards, workpoint clients, adapter) D-1
Power supply
  external applications 3-346, 3-348, 3-350
  HiPath 3350 3-67
  NT (HiPath 3550/HiPath 3500) 3-310
  NT (HiPath 3750/HiPath 3700) 3-301
Power supply unit
  HiPath 3500/HiPath 3300 3-73
  HiPath 3550/HiPath 3350 3-68
  HiPath 3750/HiPath 3700 3-79
  HiPath 3800 3-56
Presence Manager 6-7
  trace files 12-30
Privacy and Data Security 1-14
Project planning tool 2-22, 10-32
Protocols 13-2
PSUP 3-67
  Figure 3-67

Q
Quality of Service QoS 13-4

R
Ranges
  CorNet N/CorNet NQ 2-24
  telephone interfaces 2-24
  trunk connection 2-24
REAL 3-346
  cable and connector assignment 3-349
  electr. characteristics of relays 3-347
  installation location 3-347
  power failure transfer 3-346
  relay contacts 3-348
  special connections 3-346
REALS 3-350
  cable and connector assignment 3-352
  electrical characteristics of relays 3-350
  slot 3-352
  special connections via relay 3-350
  trunk failure transfer 3-350
Reinitialization 5-5, 5-14, 5-22
Reload 5-6, 5-15, 5-23
Remote access immediately after installation 12-75
Remote administration 12-74
Remote connection, controlled release 12-77
remote service 12-72
Reset board 3-111, 3-117, 3-126
Resource Manager 10-39
Ring generator
  settings (UPSM, -A100) 3-83
  settings (UPSM, -S100) 3-82

Routing (HG 1500) 10-71

S

Safety information 1-5
    caution 1-9
    danger 1-6
    warning 1-8
Safety Information for Australia 1-13
SAFETY International 2-31
Safety symbols 1-5
Security 12-79
Server net file 6-47, 6-49
Service 12-1
Service call via code 12-75
Service maintenance release SMR 12-15
Service Manual
    Configuration notes 1-2
Services, checking 12-42
Shift key 10-4
Siemens intranet 1-15
Signal wire connection 3-232
Single-cell base station 11-2, 11-3
Single-PC solution (HiPath 5000) 6-10
SIVAPAC-SIPAC board adapter 3-272, 3-280, 4-41
SLA8N/SLA16N/SLA24N 3-132
    cable and connector assignment 3-134
    connection conditions 3-138
    LED statuses 3-133
    switches and LEDs 3-132
SLC16/SLC16N (not for U.S.) 3-139
    base station power supply 3-144
    cable/connector assignment 3-142
    distribution to HiPath 3750/HiPath 3700 cabinets 3-143
    figures 3-140
    LED statuses 3-141
    lockout switch function 3-140
SLCN (not for U.S.) 3-156
    base station power supply 3-162
    cable and connector assignment 3-157
    distribution in HiPath 3800 cabinets 3-162
    front panel 3-156
    LED statuses 3-157
    LEDs 3-156
SLMA/SLMA8 3-163
    cable and connector assignment 3-164
    front panel 3-163
    LED statuses 3-164
    LEDs 3-163
SLMO2/SLMO8 3-173
    cable and connector assignment 3-174
    front panel 3-173
    LED statuses 3-174
    LEDs 3-173
SLMO8/SLMO24 3-183
    cable and connector assignment 3-185
    figure 3-183
    LED statuses 3-184
SLU8 3-189
    contact assignments 3-189
    interfaces 3-189
SLU8R 3-190
    contact assignments 3-190
    interfaces 3-190
SMR 12-15
SNMP 12-44
Software update 12-15
Software upgrade 12-15
Speech recording device optiLog 4me 10-36
Splitting strips
    assignment 4-123
Standards supported 13-3
Startup
    HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300 5-19
    HiPath 3750/HiPath 3700 5-11
    HiPath 3800 5-2

Static traffic capacity
  HiPath 3500/HiPath 3300 4-197
  HiPath 3550/HiPath 3350 4-184
  HiPath 3750/HiPath 3700 4-159
  HiPath 3800 4-48
Station diagnosis 12-27
Station status 12-27
STBG4 (for France only) 3-355
  contact assignments 3-355
  interfaces 3-355
STLS 3-191
  connecting ISDN (S0) interfaces 3-193
  connecting ISDN telephones 3-194
  connecting ISDN trunk 3-193
  interfaces 3-191
STLS4R 3-198
  contact assignments 3-199
  interfaces 3-198
STLSX2/STLSX4 3-200
  configuring ISDN (S0) interfaces 3-202
  connecting ISDN telephones 3-203
  interfaces 3-201
  S0 interface assignment 3-201
STLSX4R 3-200
  configuring ISDN (S0) interfaces 3-202
  connecting ISDN telephones 3-203
  interfaces 3-201
  S0 interface assignment 3-201
STMD3 3-205
  cable and connector assignment 3-206
  front panel 3-205
  LED statuses 3-206
  LEDs 3-205
STMD8 3-211
  cable and connector assignment 3-218
  figure 3-211
  LED statuses 3-212
  point-to-multipoint connection 3-214
  point-to-point connection 3-214
  S0 bus to station 3-216
  S0 bus wiring (for U.S. only) 3-220
  S0 connection to NT 3-213
  S0 networking 3-215
  S0 trunk connection 3-213
STMI2 3-221
  connections 3-223
  determining the required number 10-66
  extension modules 3-222
  figure 3-222
  front panel 3-224
  LAN interfaces 3-226
  Techn. Data (Resources) 10-66
  V.24 interface 3-225
  variants 3-221
STRB 3-356
  contact assignments 3-359
  interfaces 3-357
STRBR 3-356
  contact assignments 3-360
  interfaces 3-357
Subboards, inserting 4-151
Supplying power to base stations 3-147
Surge protector (HiPath 3700) for Patch Panel 4-144
Surge protector (HiPath 3750) for MDFU/MDFU-E 4119 4-122
Surge protector (HiPath 3800) for MDFU-E 4-66
Surge protector (HiPath 3800) for Patch Panel 4-72
Switches and indicators 3-35
System power requirement D-1
System software upgrade 12-11
System software, installing 4-79, 4-151

T

TAPI Service Provider 6-16, 6-34
Technical base station data 11-4
Technical Specifications 2-23
technical specifications 2-26
Telephones 10-1
Terminal test 12-37
Terminating resistors (HiPath 3700) 4-141
Terminating resistors (HiPath 3750) 4-116

TIEL 3-227
  cable and connector assignment 3-238
  data for the interface 3-229
  DIP-FIX switch positions 3-231
  figure 3-230
  interface types 3-228
  LED statuses 3-237
  signaling protocols 3-229
Time-division multiplex channels for HiPath 3750/HiPath 3700 4-156
Time-division multiplex channels for HiPath 3800 4-45
TLA2/TLA4 (not for U.S) 3-242
  contact assignments 3-242
  interfaces 3-242
TLA4R (not for U.S.) 3-244
  contact assignments 3-244
  interfaces 3-244
TLA8 (not for U.S) 3-242
  contact assignments 3-243
  interfaces 3-243
TM2LP 3-246
  cable and connector assignment 3-247
  front panel 3-246
  LED statuses 3-247
  LEDs 3-246
TMAMF 3-253
  cable and connector assignment 3-256
  DSP diagnosis, trace 3-254
  figure 3-253
  LED statuses 3-255
TMC16 (for U.S. only) 3-257
  cable and connector assignment 3-258
  front panel 3-257
  LED statuses 3-258
  LEDs 3-257
TMCAS 3-262
  in HiPath 3550 3-267
  in HiPath 3750/HiPath 3700 3-266
  seven-segment display H1 3-265
  switches, display 3-262
TMDID (for U.S. only) 3-272
  cable and connector assignment 3-273
  front panel 3-273
  LED statuses 3-272
  LEDs 3-273
  switches 3-272
TMDID8 (for U.S. only) 3-277
  cable and connector assignment 3-279
  figure 3-277
  LED statuses 3-278
  switches 3-278
TMEW2 3-280
  cable and connector assignment 3-282
  front panel 3-281
  LED statuses 3-282
  LEDs 3-281
TMGL4 (for U.S. only) 3-284
  contact assignment 3-285
  figure 3-284
TMGL4R (for U.S. only) 3-286
  contact assignment 3-287
  figure 3-286
  interfaces 3-286
TMGL8 (for U.S. only) 3-288
  cable and connector assignment 3-289
  figure 3-288
  LED statuses 3-289
  switches 3-288
TML8W (not for U.S.) 3-290
  cable and connector assignment 3-292
  figure 3-290
  jumpers for CDR 3-290
  LED statuses 3-291
TMQ4 (for U.S. only) 3-293
  contact assignment 3-294
  figure 3-293
TMS2 (not for U.S) 3-298
  jumper 3-299
  LED statuses 3-300
  NT connection 3-301
  S2M networking 3-304
  S2M trunk connection 3-301
  SU connector assignment 3-299
  switches, displays 3-298

TMST1 (for U.S. only) 3-295
  adapter 3-297
  figure 3-295
  LED statuses 3-296
Trace options
  Customer License Agent (CLA) 12-45
  Customer License Manager (CLM) 12-45
  HiPath 3000 12-29
  HiPath Inventory Manager 12-46
  HiPath Manager PCM Trace Monitor 12-30
  HiPath Software Manager 12-46
Traffic capacity (in Erlangs)
  HiPath 3500/HiPath 3300 4-197
  HiPath 3550/HiPath 3350 4-184
  HiPath 3750/HiPath 3700 4-159
  HiPath 3800 4-48
Trunk diagnostics 12-26
Trunk failure transfer 3-317, 3-343, 3-350
Trunk status 12-26
TS2 (not for U.S) 3-307
  interface assignments 3-309
  interfaces 3-308
  NT cable set for Spain/Portugal 3-311
  NT connection 3-310
  S2M trunk connection 3-310
TS2R (not for U.S) 3-307
  interface assignments 3-309
  interfaces 3-308
  NT cable set for Spain/Portugal 3-311
  NT connection 3-310
  S2M trunk connection 3-310
TST1 (for U.S. only) 3-305
  contact assignment 3-306
  figure 3-305

U

Uninterruptible power supply unit HiPath 3500/HiPath 3300
  see UPSC-DR 3-73
Uninterruptible power supply unit HiPath 3550/HiPath 3350
  see UPSC-D 3-68
Uninterruptible power supply unit HiPath 3750/HiPath 3700
  see UPSM 3-79
Uninterruptible power supply unit HiPath 3800
  see LUNA2 3-56
Uninterruptible Power Supply Unit HiPath 5000 6-59
Updating HG 1500 12-16
Updating system software 12-16
Upgrade Manager 12-16
Upgrading HiPath 3000 (HW/SW) 9-29
Upgrading the system software 12-11
UPS P 500 6-59
UPSC-D 3-68
  bridging times 3-69
  connectors 3-72
  figure 3-70
  switches and indicators 3-71
UPSC-DR 3-73
  battery pack for HiPath 3500/HiPath 3300 9-13
  bridging times 3-74
  connectors 3-78
  figure 3-75
  switches and indicators 3-77
UPSM 3-79
  battery pack for HiPath 3700 9-13
  bridging times 3-81
  figure (-A100) 3-83
  figure (-S100) 3-82
USB 1.1 interface 10-15
User groups and their access rights 12-82

V

V.24 adapter 3-363
V.24 cable, assignment 3-364
V.24 connector assignment 3-362
V.24 interfaces (HiPath 3550, HiPath 3350) 3-361
V.24 interfaces (HiPath 3700) 4-138
V.24 interfaces (HiPath 3750) 4-113
V24/1 (not for U.S.) 3-361
  figure 3-361
Version hub 12-15

Voice over IP 10-38

W
Web-based management (WBM) 3-94, 3-100, 3-221, 6-5
Workpoint client power requirement D-1
Workpoint clients 10-1

www.siemens.com/hipath

The information provided in this document contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products.
An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.
The trademarks used are owned by Siemens AG or their respective owners.

The device conforms to the EU directive 1999/5/EG, as attested by the CE mark.

This device has been manufactured in accordance with our certified environmental management system (ISO 14001). This process ensures that energy consumption and the use of primary raw materials are kept to a minimum, thus reducing waste production.

© Siemens AG 2005 • Siemens Communications •
Hofmannstraße 51 • D-81359 München, Germany
Reference No.: P31003-H3550-S403-4-7620
Subject to availability. Right of modification reserved.